

This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`


KEY TO
MANUAL
OF
NORTH METHODS IN ARITHMETIC
HUNTER

C
1802 f. 5 ⁂



KEY

TO

HUNTER'S MANUAL

OF

SHORT METHODS IN ARITHMETIC

CONTAINING SOLUTIONS OF ALL THE UNWORKED EXAMPLES IN THAT TREATISE

BY THE

REV. J. HUNTER, M.A.

LONDON
LONGMANS, GREEN, AND CO.
1884

All rights reserved

LONDON: PRINTED BY
SPOTTISWOODE AND CO., NEW-STREET SQUARE
AND PARLIAMENT STREET



KEY

TO

HUNTER'S MANUAL

OF

SHORT METHODS IN ARITHMETIC.

Exercises 1.

1.

4371	17391	3	
	13113		
2)4278	4371	2	
2139	4278		
Ans. 93	2139	23	
	186		
	279		

2.

2668	8188	3
	8004	
184	2668	14
	184	
	828	
	736	
Ans. 92	184	2

3.

73033	118007	1
2)44974	73033	3
22487	67461	
4)5572	22487	16
1393	1393	
	8557	
	8358	
Ans. 199	1393	7

4.

29735	39330	1
9595	29735	
	28785	
2)950	9595	20
475	9500	
Ans. 95	475	5

5.

58345	57670	1
9)3285	54385	149
Ans. 365	365	
	1788	
	1460	
	3285	

6.

78329	137897	1
12)59568	78329	
4)4964	7446	
1241	3869	
	3723	
2)146	1241	17
Ans. 73	73	
	511	

7.

2)56498	67691	2
28249	56498	
3)11193	28249	7
3731	26117	
4)2132	3731	7
g.c.m. 533	3731	

	2)30094	
533	15047	28
	1066	
	4387	
	4264	
3)123	533	13
Ans. 41	533	

8.

	5)266815	
22661	53363	2
	45322	
8041	22661	2
	16082	
9)6579	8041	11
g.c.m. 731	8041	

731	42527	58
	3655	
	5977	
	5848	
3)129	731	17
Ans. 43	43	
	301	

9.

348467	425383	1
4)76916	348467	18
19229	19229	
	156177	
	153832	
5)2345	19229	41
g.c.m. 469	1876	
	469	

469	228269	486
	1876	
	4066	
	3752	
	3149	
	2814	
5)335	469	7
Ans. 67	469	

Exercises 2.

1. $693 = 3 \times 3 \times 7 \times 11$; cancelling 11 gives $\frac{63}{149}$.—*Ans.*
2. $276 = 12 \times 23$; cancelling 23 gives $\frac{12}{25}$.—*Ans.*
3. $925 = 5 \times 5 \times 37$; cancelling 37 gives $\frac{19}{25}$.—*Ans.*
4. $3311 = 11 \times 7 \times 43$ cancelling 43 gives $\frac{13}{77}$.—*Ans.*
5. $2765 = 5 \times 7 \times 79$; cancelling 79 gives $\frac{35}{75}$.—*Ans.*

6. $2538 = 6 \times 9 \times 47$; cancelling 47 gives $\frac{54}{59}$.—*Ans.*

7. $4746 = 6 \times 7 \times 113$; cancelling 113 gives $\frac{31}{42}$.—*Ans.*

8. Cancelling 3 gives $\frac{668}{4681}$; then, $868 = 4 \times 7 \times 31$; cancelling 31 gives $\frac{28}{151}$.—*Ans.*

9.

323	1349	4	
	1292		
3)57	323	17	
G.C.M. 19	19		
	133		

Ans. $\frac{17}{71}$.

10.

4171	6499	1
8)2328	4171	14
291	291	
	1261	
	1164	
G.C.M. 97	291	3

Ans. $\frac{43}{67}$.

11.

3287	6631	1
11)3344	3287	173
8)304	19	
2)38	138	
G.C.M. 19	133	
	57	

Ans. $\frac{173}{349}$.

12.

2461	13589	5
	12305	
12)1284	2461	23
G.C.M. 107	214	
	321	

Ans. $\frac{23}{127}$.

Exercises 3.

1.

7*s.*	$3\frac{3}{4}$*d.*	
	12	
2)87	9	
43	$10\frac{1}{2}$	
131	$7\frac{1}{2}$	

£6 11*s.* $7\frac{1}{2}$*d. Ans.*

2.

78*s.*	$11\frac{1}{4}$*d.*	
	12	
2)947	3	
473	$7\frac{1}{2}$	
1499	$9\frac{3}{4}$	

£74 19*s.* $9\frac{3}{4}$*d. Ans.*

3.

119*s.*	$10\frac{1}{2}$*d*	
	12	
4)1438	6	
359	$7\frac{1}{2}$	
1798	$1\frac{1}{2}$	

£89 18*s.* $1\frac{1}{2}$*d. Ans.*

4.

17*s.*	$8\frac{1}{4}$*d.*	
	12	
3)212	3	
70	9	
300	$8\frac{1}{4}$	

£15 0*s.* $8\frac{1}{4}$*d. Ans.*

5. 6*s.* 5*d.* × 20
= £6 + 1*s.* 8*d.* × 5
= £6 8*s.* 4*d. Ans.*

6.

13*s.*	$6\frac{1}{2}$*d.*	
	12	
$162\frac{1}{2}$*s.*		

= £8 2*s.* 6*d. Ans.*

7. 164*s.* 5*d.*

12

1973 0

2137 5

£106 17*s.* 5*d.* *Ans.*

8. 16*s.* 10½*d.*

12

2)202 6

2)101 3

50 7½

354 4½

£17 14*s.* 4½*d.* *Ans.*

9. 30*s.* 8¼*d.*

12

368 3

£18 8*s.* 3*d.* *Ans.*

10. 17*s.* 9½*d.*

12

213 6

231 3½

£11 11*s.* 3½*d.* *Ans.*

11. 15*s.* 7¾*d.*

12

187 9

£9 7*s.* 9*d.* *Ans.*

12. 51*s.* 9¾*d.*

12

2)621 9

2)310 10½

155 5¼

1088 0¾

£54 8*s.* 0¾*d.* *Ans.*

13. 30*s.* 6*d.*

20

£30½

or £30 10*s.* *Ans.*

14. 189*s.* 10*d.*

12

2278 0

£113 18*s.* *Ans.*

15. 133*s.* 11½*d.*

12

1607 6

1741 5½

£87 1*s.* 5½*d.* *Ar*

16 14¾*s.* × 20 = £14¾ = £14 15*s.* *Ans.*

17. 6*s.* 11*d.*

12

4)83 0

20 9

103 9

£5 3*s.* 9*d.* *Ans.*

18. 14*s.* 5¼*d.*

12

2)173 3

86 7½

274 3¾

£13 14*s.* 3¾*d.* *Ans.*

19. 67*s.* $3\frac{3}{4}$*d.*

12

2)807 9

403 $10\frac{1}{2}$

1211 $7\frac{1}{2}$

£60 11*s.* $7\frac{1}{2}$*d.* *Ans.*

20. 12*s.* $11\frac{1}{2}$*d.* × 10

12

195 6

129 7

285 1

£14 5*s.* 1*d.* *Ans.*

21. 36*s.* $1\frac{1}{4}$*d.* × 11

12

433 3

397 $1\frac{3}{4}$

830 $4\frac{3}{4}$

£41 10*s.* $4\frac{3}{4}$*d.* *Ans.*

22. 97*s.* 6*d.*

12

2)1170 0

2) 585 0

292 6

2047 6

£102 7*s.* 6*d.* *Ans.*

Exercises 4.

1. 260 at 15*s.* 2*d.*

240	£182		
$20=\frac{1}{12}$	15	3	4
Ans.	£197	3	4

2. 264 at 9*s.* $1\frac{1}{2}$*d.*

240	£109	10	0
$24=\frac{1}{10}$	10	19	0
Ans.	£120	9	0

3. 320 at 4*s.* $11\frac{1}{2}$*d.*

240	£59	5	0
$80=\frac{1}{3}$	19	15	0
Ans.	£79	0	0

4. 247 at 13*s.* 7*d.*

240	£163	0	0
7	4	15	1
Ans.	£167	15	1

5. 344 at 16*s.* $3\frac{1}{2}$*d.*

240	£195	5	0
$80=\frac{1}{3}$	65	1	8
$24=\frac{1}{10}$	19	10	6
Ans.	£279	17	2

6. 340 at 28*s.* 5*d.*

240	£341	0	0
$80=\frac{1}{3}$	113	13	4
$20=\frac{1}{4}$	28	8	4
Ans.	£483	1	8

7. 136 at 29*s.* 8*d.*

240	£356		
$120=\frac{1}{2}$	178	0	0
$12=\frac{1}{10}$	17	16	0
$4=\frac{1}{3}$	5	18	8
Ans.	£201	14	8

Otherwise, by Practice.

s.	*d.*		£136	0	0
5	0	$=\frac{1}{4}$	34	0	0
4	0	$=\frac{1}{5}$	27	4	0
0	8	$=\frac{1}{6}$	4	10	8
			£201	14	8

8. 368 at 10*s.* 8½*d.*

240	£128	10	0
80 = ⅓	42	16	8
48 = ⅕	25	14	0
Ans.	£197	0	8

9. 97 at 54*s.* 10*d.*

240	£658		
120 = ½	329	0	0
60 = ¼	164	10	0
12 = 1/20	32	18	0
5 = 1/12	13	14	2
Ans.	£540	2	2

10. 294 at 17*s.* 8*d.*

240	£212	0	0
24 = 1/10	21	4	0
30 = ⅛	26	10	0
Ans.	£259	14	0

11. 271 at 5*s.* 3¼*d.*

240	£63	5	0
30 = ⅛	7	18	1½
1	0	5	3¼
Ans.	£71	8	4¾

12. 119 at 13*s.* 11*d.*

240	£167	0	0
120 = ½	83	10	0
−1	−0	13	11
Ans.	£82	16	1

13. 287 at 18*s.* 10*d.*

240	£226	0	0
48 = ⅕	45	4	0
	271	4	0
−1	−0	18	10
Ans.	£270	5	2

14. 93 at 77*s.* 10½*d.*

240	£934	10	0
80 = ⅓	311	10	0
12 = 1/20	46	14	6
1	3	17	10½
Ans.	£362	2	4½

15. 291 at 29*s.* 7½*d.*

240	£355	10	0
40 = 1/6	59	5	0
10 = ¼	14	16	3
1	1	9	7½
Ans.	£431	0	10½

16. 366 at 113*s.*

240	£1356	0	0
120 = ½	678	0	0
6 = 1/20	33	18	0
Ans.	£2067	18	0

17. 184 at 19*s.* 5*d.*

240	£233		
80 = ⅓	77	13	4
80 = ⅓	77	13	4
24 = 1/10	23	6	0
Ans.	£178	12	8

18. 79 at 4*s.* 9¾*d.*

240	£57	15	0
80 = ⅓	19	5	0
−1	−0	4	9¾
Ans.	£19	0	2¼

19. 89 at 5*s.* 1¾*d.*

240	£61	15	0
48 = ⅕	12	7	0
40 = 1/6	10	5	10
1	0	5	1¾
Ans.	£22	17	11¾

20. 375 at 12*s.* 7¾*d.*

240	£151	15	0
120 = ½	75	17	6
15 = ⅛	9	9	8¼

Ans. £237 2 2¼

21. 372 at 7*s.* 9*d.*

240	£93	0	0
120 = ½	46	10	0
12 = 1/10	4	13	0

Ans. £144 3 0

22. 127 at 73*s.* 2*d.*

240	£878		
120 = ½	439	0	0
6 = 1/20	21	19	0
1	3	13	2

Ans. £464 12 2

23. 348 at 6*s.* 9¾*d.*

240	£81	15	0
60 = ¼	20	8	9
48 = ⅕	16	7	0

Ans. £118 10 9

24. 411 at 66*s.* 5*d.*

240	£797	0	0
80 = ⅓	265	13	4
80 = ⅓	265	13	4
10 = ⅛	33	4	2
1	3	6	5

Ans. £1364 17 3

25. 265 at 11*s.* 2½*d.*

240	£134	5	0
20 = 1/12	11	3	9
5 = ¼	2	15	11¼

Ans. £148 4 8¼

26. 113 at 32*s.* 7*d.*

240	£391		
80 = ⅓	130	6	8
30 = ⅛	48	17	6
3 = 1/10	4	17	9

Ans. £184 1 11

27. 452 at 19*s.* 3½*d.*

240	£231	10	0
120 = ½	115	15	0
80 = ⅓	77	3	4
12 = 1/20	11	11	6

Ans. £435 19 10

28. 365 at 4*s.* 9½*d.*

240	£57	10	0
80 = ⅓	19	3	4
30 = ⅛	7	3	9
15 = ½	3	11	10½

Ans. £87 8 11½

29. 855 at 86*s.* 4½*d.*

240	£1036	10	0
720	3109	10	0
120 = ½	518	5	0
15 = ⅛	64	15	7½
	3692	10	7½

30. 299 at 11*s.* 9¾*d.*

240	£141	15	0
60 = ¼	35	8	9
	177	3	9
−1	− 0	11	9¾

Ans. £176 11 11¼

31. 547 at 12*s.* 11¾*d.*

240	£155	15	0
240	155	15	0
60 = ¼	38	18	9
6 = 1/10	3	17	10½
1	0	12	11¾

Ans. £354 19 7½

32. 351 at 97*s.* 7*d.*

240	£1171	0	0
80 = $\frac{1}{3}$	390	6	8
30 = $\frac{1}{8}$	146	7	6
1	4	17	7
Ans.	£1712	11	9

33. 390 at 36*s.* 10$\frac{1}{4}$*d.*

240	£442	5	0
120 = $\frac{1}{2}$	221	2	6
30 = $\frac{1}{4}$	55	5	7$\frac{1}{2}$
Ans.	£718	13	1$\frac{1}{2}$

34. 558 at 65*s.* 8*d.*

240	£788	0	0
240	788	0	0
48 = $\frac{1}{5}$	157	12	0
30 = $\frac{1}{8}$	98	10	0
Ans.	£1832	2	0

35. 503 at 21*s.* 8$\frac{1}{2}$*d.*

240	£260	10	0
240	260	10	0
24 = $\frac{1}{10}$	26	1	0
	547	1	0
−1	− 1	1	8$\frac{1}{2}$
Ans.	545	19	3$\frac{1}{2}$

36. 615 at 53*s.* 6*d.*

240	£642	0	0
240	642	0	0
120 = $\frac{1}{2}$	321	0	0
15 = $\frac{1}{8}$	40	2	6
Ans.	£1645	2	6

37. 365 at 15*s.* 8$\frac{1}{4}$*d.*

240	£188	5	0
80 = $\frac{1}{3}$	62	15	0
30 = $\frac{1}{8}$	23	10	7$\frac{1}{2}$
15 = $\frac{1}{16}$	11	15	3$\frac{3}{4}$
Ans.	£286	5	11$\frac{1}{4}$

38. 139 at 36*s.* 2$\frac{1}{2}$*d.*

240	£434	10	0
120 = $\frac{1}{2}$	217	5	0
20 = $\frac{1}{6}$	36	4	2
	253	9	2
−1	− 1	16	2$\frac{1}{2}$
Ans.	£251	12	11$\frac{1}{2}$

39. 857 at 51*s.* 4*d.*

240	£616		
720	1848	0	0
48 = $\frac{1}{15}$	123	4	0
48 = $\frac{1}{5}$	123	4	0
40 = $\frac{1}{6}$	102	13	4
1	2	11	4
Ans.	£2199	12	8

40. 169 at 34*s.* 3*d.*

240	£411		
120 = $\frac{1}{2}$	205	10	0
48 = $\frac{1}{5}$	82	4	0
1	1	14	3
Ans.	£289	8	3

Exercises 5.

1. 210 at $14\frac{7}{8}d.$

240	£14	17	6
$120 = \frac{1}{2}$	7	8	9
$60 = \frac{1}{4}$	3	14	$4\frac{1}{2}$
$30 = \frac{1}{8}$	1	17	$2\frac{1}{4}$
Ans.	£13	0	$3\frac{3}{4}$

2. $9\frac{7}{12}$ at 9*s.* $7\frac{1}{2}d.$

			9
	£4	6	$7\frac{1}{2}$
$\frac{6}{12} = \frac{1}{2}$		4	$9\frac{3}{4}$
$\frac{1}{12} = \frac{1}{6}$		0	$9\frac{1}{2}$
Ans.	£4	12	$2\frac{3}{4}$

3. 317 at $6d. = 158s.\ 6d. = £7\ 18s.\ 6d.$
at $3d. = 79\ 3$
at $\frac{1}{8}$ of $3d. = 0\ 9\ 11$
Ans. £8 8 5

4. $133\frac{1}{2}$ at $7\frac{1}{4}d.$

240	£7	5	0
$120 = \frac{1}{2}$	3	12	6
$12 = \frac{1}{10}$	0	7	3
$1\frac{1}{2} = \frac{1}{8}$	0	0	11
Ans.	£4	0	8

5. $131\frac{1}{4}$ at $9\frac{1}{12}d.$

240	£9	1	8
$120 = \frac{1}{2}$	4	10	10
$10 = \frac{1}{12}$	0	7	$6\frac{3}{4}$
$1\frac{1}{4} = \frac{1}{8}$	0	0	$11\frac{1}{4}$
Ans.	£4	19	4

6. 358 at $6d. = 179s. = £8\ 19s.\ 0d.$
at $\frac{1}{4}d. = 89\frac{1}{2}d. = 0\ 7\ 5\frac{1}{2}$
Ans. £8 11 $6\frac{1}{2}$

7. 280 at $7\frac{1}{8}d.$

240	£7	2	6
$40 = \frac{1}{6}$	1	3	9
Ans.	£8	6	3

8. 55 at $42\frac{3}{4}d.$

240	£42	15	0
$60 = \frac{1}{4}$	10	13	9
$-5 = \frac{1}{12}$	0	17	$9\frac{3}{4}$
Ans.	£9	15	$11\frac{1}{4}$

9. $276\frac{1}{4}$ at $5\frac{5}{8}d.$
at $5d. = 1381\frac{1}{4}d. = 115s.\ 1\frac{1}{4}d.$
at $\frac{1}{8}$ of $5d. = 14\ 4\frac{3}{4}$
$129s.\ 6d.$
Ans. £6 9*s.* 6*d.*

10. $156\frac{5}{8}$ at $2\frac{3}{4}d. = \frac{1}{4}$ of $1722\frac{7}{8}d. = 430\frac{3}{4}d.$
Ans. 35*s.* $10\frac{3}{4}d.$

11. $113\frac{3}{4}$ at $16\frac{5}{12}d.$

240	£16	8	4
$80 = \frac{1}{3}$	5	9	$5\frac{1}{4}$
$30 = \frac{1}{8}$	2	1	$0\frac{1}{2}$
$3\frac{3}{4} = \frac{1}{8}$	0	5	$1\frac{1}{2}$

Ans. £7 15 $7\frac{1}{4}$

12. $8\frac{3}{8}d. \times 4 \times 7$
$= 33\frac{1}{2}d. \times 7$
$= 234\frac{1}{2}d. = 19s.\ 6\frac{1}{2}d.$ *Ans.*

13. $4\frac{1}{3}$ at $21\frac{11}{12}s. = 21s.\ 11d. \times 4\frac{1}{3}$
$= £4\ 7s.\ 8d. + 7s.\ 4d.$
$= £4\ 15s.$ *Ans.*

14. $19\frac{1}{4}$ at $14\frac{5}{6}d.$
at $9d. = 173\frac{1}{4}d.$
at $5d. = 96\frac{1}{4}$
at $\frac{1}{6}$ of $5d. = 12$
$281\frac{1}{2}d.$
Ans. $23s.\ 5\frac{1}{2}d.$

15. $23\frac{7}{8}$ at $43\frac{3}{4}d.$

240	£43	15	0
$24 = \frac{1}{10}$	4	7	6
$-\frac{1}{8}$	−0	0	$5\frac{1}{2}$

Ans. £4 7 $0\frac{1}{2}$

16. $37\frac{1}{2}$ at $31\frac{7}{12}d.$

240	£31	11	8
$30 = \frac{1}{8}$	3	18	$11\frac{1}{2}$
$7\frac{1}{2} = \frac{1}{4}$	0	19	$8\frac{3}{4}$

Ans. £4 18 $8\frac{1}{4}$

17. $29\frac{3}{4}$ at $21\frac{1}{4}d.$

240	£21	5	0
$30 = \frac{1}{8}$	2	13	$1\frac{1}{2}$
$-\frac{1}{4}$	−0	0	$5\frac{1}{4}$

Ans. £2 12 $8\frac{1}{4}$

18. $37\frac{5}{8}$ at $13\frac{3}{8}d.$
at $10d. = 376\frac{1}{4}d.$
at $3d. = 112\frac{3}{4}$
at $\frac{1}{8}$ of $3d. = 14$
$503d.$
Ans. $41s.\ 11d.$

19. $19\frac{1}{4}$ at $9\frac{1}{8}d.$

12	at $9\frac{1}{8}d.$	$= 9s.$	$1\frac{1}{8}d.$
6	„	$= 4$	$6\frac{3}{4}$
1	„	$= 0$	$9\frac{3}{8}$
$\frac{1}{4}$	„	$= 0$	$2\frac{1}{4}$

Ans. $14s.\ 7\frac{1}{2}d.$

20. $90\frac{7}{8}s. = £4\ 10s.\ 10\frac{1}{2}d.$

$6d. = \frac{1}{5}$	2	5	$5\frac{1}{4}$
$2d. = \frac{1}{3}$	0	15	$1\frac{3}{4}$
$\frac{3}{4}d. = \frac{1}{3}$	0	5	8

Ans. £3 6 3

21. $31\frac{1}{2}$ at $23\frac{5}{8}d.$

240	£23	12	6
$30 = \frac{1}{8}$	2	19	$0\frac{3}{4}$
1	0	1	$11\frac{1}{2}$
$\frac{1}{2}$	0	0	$11\frac{3}{4}$

Ans. £3 2 0

22. $47\frac{1}{2}$ at $27\frac{1}{12}d.$
$27\frac{1}{12}$ at $4s. = 108s.\ 4d.$
at $\frac{1}{2}d. = 1\ 1\frac{1}{2}$
$107s.\ 2\frac{1}{2}d.$
Ans. £5 7s. $2\frac{1}{2}d.$

23. $190\frac{7}{8}d. = £0\ 15s.\ 10\frac{7}{8}d.$
$190\frac{7}{8}s. = 9\ 10\ 10\frac{1}{2}$
Cost at $2s. = 19\ 1\ 9$
at $\frac{1}{2}d. = 0\ 7\ 11\frac{1}{2}$
$12)18\ 13\ 9\frac{1}{2}$
Ans. £1 11s. $1\frac{3}{4}d.$

24. 8)£89¼ = £89 5*s.* 0*d.*
£11 3 1½ = cost at 2*s.* 6*d.*
8)89¼*d.*
11
78¼*d.* = 0 6 6¼ = cost at 0 0 7/8
12)£10 16 7¼
Ans. £0 18 0½

Exercises 6.

1. 62057 × 248
496456 × 3
1489368
15390136 *Ans.*

2. 62057 × 549
558513 × 6
3351078
34069293 *Ans.*

3. 807439 × 426
4844634 × 7
33912438
343969014 *Ans.*

4. 807439 × 819
7266951 × 9
65402559
661292541 *Ans.*

5. 148703 × 726
892218 × 12
10706616
107958378 *Ans.*

6. 148703 × 497
1040921 × 7
7286447
73905391 *Ans.*

7. 27738 × 742
194166 × 6
1164996
20581596 *Ans.*

8. 27738 × 856
221904 × 7
1553328
23743728 *Ans.*

9. 2507386 × 654
15044316 × 9
135398844
1639830444 *Ans.*

10. 7363891 × 648
58911128 × 8
471289024
4771801368 *Ans.*

11.

891257
3204
3565028 × 8
28520224
2855587428 *Ans.*

12.

3926
8723
31408 × 9
282672
11778
4)34246498.. × 25
856162450 *Ans.*

13.

7465
9819
67185 × 9
604665
67185
73298835.. × 99
73298835
7256584665 *Ans.*

14.

8297 × 365
2)82970
41485 × 7
290395
3028405 × 321
6056810
9085215
972118005 *Ans.*

15.

511736
36120
6140832 × 3
18422496
18483904320 *Ans.*

16.

993865
51236
4969325
11926380 × 3
35779140
50921667140 *Ans.*

17.

83754
2643
251262 × 8
2010096
2010096
221361822 *Ans.*

18.

9738
8379
87642
262926 = 9 times × 3
788778 = 9 „ × 9
4)81594702.. × 25
2039867550 *Ans.*

19.

9586
6954
57516
86274 × 6
517644
66661044.. × 99
66661044
6599443356 *Ans.*

20.

8759
56749
61313
429191 = 7 times × 7
490504 = 7 „ × 8
497064491 *Ans.*

21.
2786
12786
16716 × 3
50148 × 7
351036
8)35621796... × 125
4452724500 *Ans.*

22.
187548
630728
1312836
5251344 = 7 times × 4
11815524 = 7 „ × 9
118291774944 *Ans.*

23.
42308
7854
253848 × 3
761544 × 3
2284632
332287032 *contd.*

332287032
5296
1329148128 × 3
3987444384 × 8
31899555072
1759792121472 *Ans.*

24.
54387
13296
652644
652644 × 8
5221152
723129552 *Ans.*

25.
9356
4962
18712 × 8
149696 × 3
449088
46424472 *contd.*

25 *continued.*
2)46424472. × 365
232122360 × 7
1624856520
16944932280 *Ans.*

26.
170625 × 8
1365000
9587000
1365
124631000 × 5
623155000
13086255000 *Ans.*

Exercises 7.

1. 156*s.* 6*d.* ÷ 2*s.* 1*d.* = 1878 ÷ 25
4
75·12 lb. *Ans.*

2. 126*s.* ÷ 10*s.* 5*d.* = 1512 ÷ 125
8
12·096 gall. *Ans.*

3. $\frac{24}{25}$ of $693{\cdot}4 = 693{\cdot}4 - \frac{1}{25}$ of $693{\cdot}4$

$= 693{\cdot}4 - \overline{27{\cdot}736}$

$= 665{\cdot}664$ cub. ft. *Ans.*

4. $256\frac{1}{8}$ qu. × 8 = 2053 bu. ÷ 75

3)20·53

6·84⅓

27·37⅓ *Ans.*

5. (i.) 3)·25934

·08644⅔

·34578⅔ *Ans.*

(ii.) 85508·28

855·08

8·55

·09

86372·00 *Ans.*

6. (i.) 25908 × ·002

3	51·816
10	17·272
10	1·7272
	·1727
10000	70·9879
	·0071

Ans. 70·9808

(ii.) 1234567·89

12345·68

123·46

1·23

·01

Ans. 1247038·27

7. 2406·67*s.* × ·002

3	4·81334
10	1·60444
10	·16044
	·01604
10000	6·59426
	·00066

6·59360*s.*

Ans. 6*s.* 7·123*d.*

8. 76880·9 × ·003

5	230·6427
100	46·1285
10	·4613
−10	·0461
	277·2786
	·0046

Ans. 277·274 gall.

9. (i.) 117·918 oz. ÷ 8⅓ oz.

= 353·754 ÷ 25 × 4

14·15016 *Ans.*

(ii.) 117·918 oz. ÷ 62½

= 235·836 oz. ÷ 125 × 8

1·886688 oz. *Ans.*

10

14090·5*s.* × ·002

3	28·1810
10	9·39366
10	·93937
	·09394
10000	38·60797
	·00386

38 60411*s.* = 38*s.* 7·249*d. Ans.*

11.

01234 ÷ $9\frac{3}{8}$

= ·09872 ÷ 75

3)·0009872

·0003291 −

·0013163 − *Ans.*

12.

1234 × ·002

3	2·468
10	·822666
10	·082267
	·008227
10000	3·38116
	·00034

3·38082 ÷ ·75

3)3·38082

1·12694

4·50776 *Ans.*

13.

7011*s.* × ·002

3	14·022
10	4·674
10	·4674
	·0467
10000	19·2101
	·0019

s. 19·2082

d. 2·4984

or 19*s.* $2\frac{1}{2}$*d. Ans.*

14.

9999 × ·003

5	29·997
100	5·9998
10	·0600
−10	·0060
	36·0628
	·0006

36·0612 *Ans.*

15.

64777·78

647·78

6·48

·06

65432·10 *Ans.*

16.

111111 *f* ÷ 365 *f*

·002

3	222·222
10	74·074
10	7·4074
	·7407
10000	304·4441
	·0304

Ans. 304·4137

17.

5000

·003

5	15·000
100	3·000
10	·030
−10	·003
	18·033
	·0003

Ans. 18·0327 gall.

18. 2840*s.* × ·002

3	5·68
10	1·89333
10	·18933
.	·01893
10000	7·7816
	·0007
	7·781*s.*

Ans. 7*s.* 9·372*d.*

19. 303910000 × ·002

3	607820
10	202606·6⅔
10	20260·6⅔
	2026·0⅔
10000	832713·4
	83·3

Ans. 832630

20.

	26812·17
	268·122
	2·681
	·027
	27083·000 ÷ 365
	·002
	54·166 *cont.*

3	54·166
10	18 0553
10	1·8055
	·1806
10000	74·2074
	·0074

Ans. 74·2

21.

	19·58
	14·07
	13706
	27412
	275·4906
	5⅝
8)	1377·4530
	172·1816
	1549·6346
	1728
	123970768
	1115736912
	15496346
	2677768·5888

or 2677768·6 cub. in. *cont.*

2677768·6 × ·003

5	8033·3058
100	1606·6609
10	16·0666
−10	1·6067
	9657·6400
	−·16

Ans. 9657·48 gall.

22.

2)	3650
	1825 × 7
	12775
	·133225
	1332
	13

Ans. ·134570

Exercises 8.

1.

$$\begin{array}{rl} & 114{\cdot}75 \\ {\cdot}05 \times 83 = & 4{\cdot}15 \\ & \overline{172125} \\ & 45900 \\ & \overline{476{\cdot}2125} \times {\cdot}002 \\ 3 \mid & {\cdot}9524 \\ 10 \mid & {\cdot}3175 \\ 10 \mid & {\cdot}0317 \\ & {\cdot}0032 \\ \overline{10000} \mid & \overline{1{\cdot}3048} \\ & {\cdot}0001 \\ & \overline{£1{\cdot}3047} \\ & s.\ 6{\cdot}094 \end{array}$$

26s. 1·13d. Ans.

2.

$$\begin{array}{rl} & 462{\cdot}925 \times {\cdot}04 \\ & \overline{18{\cdot}517} \\ & 113 \\ & \overline{55551} \\ & 203687 \\ & \overline{2092{\cdot}421} \times {\cdot}002 \\ 3 \mid & 4{\cdot}1848 \\ 10 \mid & 1{\cdot}3949 \\ 10 \mid & {\cdot}1395 \\ & {\cdot}0140 \\ \overline{10000} \mid & \overline{5{\cdot}7332} \\ & {\cdot}00057 \\ & \overline{£5{\cdot}73263} \\ & s.\ 14{\cdot}6526 \end{array}$$

£5 14s. 7·83d. Ans.

3.

$$\begin{array}{rl} & £129\ 11\tfrac{2}{11}s. \times {\cdot}03 \\ & \overline{3{\cdot}8875} \times 206 \\ & 38875 \\ & 233250 \\ & \overline{800{\cdot}825} \times {\cdot}002 \\ 3 \mid & 1{\cdot}6016 \\ 10 \mid & {\cdot}5339 \\ 10 \mid & {\cdot}0534 \\ & {\cdot}0053 \\ \overline{10000} \mid & \overline{2{\cdot}1942} \\ & {\cdot}0002 \\ & \overline{£2{\cdot}1940} \\ & s.\ 3{\cdot}880 \end{array}$$

£2 3s. 10·56d. Ans.

4.

$$\begin{array}{rl} & 1691s.\ 9d. \\ & £20301 \times {\cdot}035 \\ 240 \mid & 710{\cdot}535 \\ 30 = \tfrac{1}{8} \mid & 88{\cdot}817 \\ 8 = \tfrac{1}{30} \mid & \overline{23{\cdot}684} \\ & 823{\cdot}036 \times {\cdot}002 \\ 3 \mid & 1{\cdot}646072 \\ 10 \mid & {\cdot}548691 \\ 10 \mid & {\cdot}054869 \\ & {\cdot}005487 \\ \overline{10000} \mid & \overline{2{\cdot}255119} \\ & {\cdot}000225 \\ & \overline{£2{\cdot}254894} \\ & s.\ 5{\cdot}09788 \end{array}$$

£2 5s. 1·174d. Ans.

5. 9836*s.* 9*d.*

£118041 × ·025

240	£2951·025
80 = $\frac{1}{3}$	983·67
80 = $\frac{1}{3}$	983·67
60 = $\frac{1}{4}$	737·76
3 = $\frac{1}{20}$	36·89
	2741·99 × ·002
3	5·48398
10	1·82800
10	·18280
	·01828
10000	7·51306
	·00075
	£7·51231
	s. 10·2462

Ans. £7 10*s.* 2·954*d.*

6. 1·91 × $\frac{21}{4}$

382

4)40·11

10·0275

1108

802200

1103025

s. *d.*	11110·47
10 0 = $\frac{1}{2}$	5·01375
2 6 = $\frac{1}{4}$	1·25344
1 3 = $\frac{1}{8}$	·62672
	11117·3639 × ·002
3	22·23473
10	7·41157
10	·74116
	·07411
10000	30·46157
	·00304
	£30·45853
	s. 9·1706

Ans. £30 9*s.* 2·047*d.*

7. 26594*s.* 11*d.*

for 296 da. at 4$\frac{1}{3}$ per cent.

3191·39 × $\frac{9}{2}$

)28722·51

240	£14361·25
48 = $\frac{1}{5}$	2872·25
8 = $\frac{1}{6}$	478·71
	17712·21 ÷ 365

cont. 17712·21 × ·002

3	35·42442
10	11·80814
10	1·18081
	·11808
10000	48·53145
	·00485
	£48·5266
	s. 10·532

Ans. £48 10*s.* 6·384*d.*

8. 1897*s.* 4*d.*

for 143 days at 3$\frac{1}{4}$ p.c.

22768 × $\frac{13}{4}$

68304

4)295984

240	£739·96
80 = $\frac{1}{3}$	246·65
60 = $\frac{1}{4}$	184·99
3 = $\frac{1}{20}$	9·25
	440·89

440·89 × ·002

3	·88178
10	·29393
10	·02939
	·00294
10000	1·20804
	·00012
	£1·20792
	s. 4·1584

£1 4*s.* 1·9*d.* *Ans.*

Exercises 9.

1.

186·25 × ·03
5·5875
191·8375
5·7551
197·5926
5·9278
203·5204
6·1056
£209·6260
or £209 12*s.* 6·24*d.* *Ans.*

2.

654·1625
$2\frac{1}{2} = \frac{1}{40}$ = 16·3541
$1 = \frac{1}{100}$ = 6·5416
677·0582
16·9264
6·7706
700·7552
17·5189
7·0076
725·2817
18·1320
7·2528
750·6665
or £750 13*s.* 3·96*d.* *Ans.*

3.

1179·72916 × ·03¼
35·39187
$\frac{1}{400}$ = 2·94932
1218·07035
36·54211
3·04518
1257·65764
37·72973
3·14414
1298·53151
1179·72916
118·80235
or £118 16*s.* 0·56*d.* *Ans.*

4.

1·025
$2\frac{1}{2} = \frac{1}{40}$ ·025625
1·050625
·026266
1·076891
·026922
1·103813
·027595
$1·025^5 = 1·131408$
1·131408)400·0
353·5418
or £353 10*s.* 10·03*d.* *Ans.*

5.

1·0525
$5 = \frac{1}{20}$ = ·052625
$\frac{1}{4} = \frac{1}{20}$ = ·00263125
1·10775625
·05538781
·00276939
$1·0525^3 = 1·16591345$
1·16591345)1178·204 $\frac{2}{3}$
3·49774035)3534·6125
1010·5411
or £1010 10*s.* 10*d.* *Ans.*

6.

1·045
$2\frac{1}{2} = \frac{1}{40}$ = ·026125
$2 = \frac{1}{50}$ = ·0209
1·092025
·0273006
·0218405
1·1411661
·0285292
·0228233
1·1925186
·0298130
·0238503
1·2461819
·0311545
·0249236
$1·045^6 = 1·3022600$
int. on 1 = ·30226

6 *cont.*

·30226)17·2791$\frac{2}{3}$
·90678)51·8375
57·16656
or £57 3*s.* 3·97*d.* *Ans.*

MISCELLANEOUS QUESTIONS.

1. Strike out 2 from 4218; the G.C.M of 2109 and 4389 is found in the usual way to be 57. *Ans.*

2. $27\frac{7}{8}$*s.* per cwt. = £27 17*s.* 6*d.* per ton;
20 tons at $557\frac{1}{2}$*s.* = £557 10*s.* 0*d.*
1 ton = 27 17 6
19 tons = £529 12 6 *Ans.*

3. Cost of $\frac{24}{20}$ of a ton = $1\frac{1}{5}$ of £6 11*s.* $8\frac{1}{2}$*d.*
$\frac{1}{5}$ = 1 6 4
7 18 $0\frac{1}{2}$
$\frac{1}{20}$ of a ton = 0 6 7
$\frac{23}{20}$ „ = £7 11*s.* $5\frac{1}{2}$*d.* *Ans.*

4. (i.) 4)239..
5975
Ans. 17925

(ii.) 1426054 × ·01$\frac{1}{3}$
475351$\frac{1}{3}$
Ans. 19014·05$\frac{1}{3}$

5. (i.) 6834
5397
47838 × 7
334866
334866
36883098 *Ans.*

(ii.) 1368..
1368
135432 *Ans.*

6. (i.) 460 at 34*s.* 9*d.*

240	£417
80 = $\frac{1}{3}$	139
80 = $\frac{1}{3}$	139
60 = $\frac{1}{4}$	104 5

Ans. £799 5*s.*

(ii.) 365 at 55*s.* $4\frac{1}{2}$*d.*

240	£664 10*s.* 0*d.*
80 = $\frac{1}{3}$	221 10 0
30 = $\frac{1}{8}$	83 1 3
15 = $\frac{1}{2}$	41 10 $7\frac{1}{2}$

Ans. £1010 11 $10\frac{1}{2}$

7. (i.) 6·321
·01236
75852
227556
·07812756 *Ans.*

(ii.) 8)4567...
570875 *Ans.*

8.

5)39780	370188	46
7956	31824	
	51948	
	47736	
4212	7956	1
3744	4212	1
Ans. 468	3744	8

9. (i.) 289 at 16*s.* 10½*d.*

240	£202	10	0
48 = ⅕	40	10	0
1	0	16	10½
Ans.	£243	16	10½

(ii.) 12⅝ at £9 13*s.* 3*d.*

	115	19	0
⅛ = ¼ =	2	8	3¾
1/16 = ¼ =	0	12	1
Ans.	£118	19	4¾

10. (i.) 4789
732·84

57468
402276 = 12 times × 7
344808 = ditto × 6
3509570·76 *Ans.*

(ii.) 578..
¼ = 14450
43350 *Ans.*

11. £225 13*s.*
4513*s.* × ·002

3	9·026
10	3·0086
10	·3009
	·0301
10000	12·3656
	·0012
	12·3644*s.*

12*s.* 4·37*d.* *Ans.*

12. 365 at 9*s.* 11½*d.*

240	£119	10	0
80 = ⅓	39	16	8
30 = ⅛	14	18	9
15 = ½	7	9	4½
	£181	14	9½

13.

5)13505	15987	5
2701	13505	
2)2482	2701	2
1241	2482	
3)219	1241	17
73	73	
	511	

14. (i.) 9999..
9999

4)989901..
Ans. 24747525

(ii.) 674...
674

4)673326..
16833150
Ans. 50499450

15. (i.) 310 at 8*s.* 5¼*d.*

240	£101	5	0
60 = ¼	25	6	3
10 = ⅛	4	4	4½
Ans.	£130	15	7½

(ii.) 477 at 6*s.* 1¾*d.*

240	£ 73	15	0
240	73	15	0
	147	10	0
−3	0	18	5¼
Ans.	£146	11	6¾

16.

3794
8526
22764 × 2
45528 × 7
318696
32347644 × ·008
258781·152 *Ans.*

17. 366 at 4*s.* 5½*d.*

240	£53 10 0
120 = ½	26 15 0
6 = 1/20	1 6 9

Ans. £81 11 9

18.

109·26
109·26
65556 × 2
131112 × 9
1180008
11937·7476 ÷ 365
cont.

11937·75 × ·002

3	23·87550
10	7·95850
10	·79585
	·07958
10000	32·70943
	·00327

Ans. 32·70616

19.

277·274
27365
3604562
18022810 = 13 times × 5
7209124 = ditto × 2
7587603·010 c. in. *Ans.*

20. (i.) 47 yds. at 20¾*d.*

20¾ yds. at (4*s.* − 1*d.*)
4
83*s.* = £4 3*s.* 0*d.*
20¾*d.* = 0 1 8¾
Ans. £4 1*s.* 3¼*d.*

(ii.) 53 at 19⅛*d.*

240	£19 2*s.* 6*d.*
40 = ⅙	3 3 9
12 = 1/20	0 19 1½
1	0 1 7⅛

Ans. £4 4*s.* 5½*d.*

21. (i.)

2869
2968
22952 × 12
275424
5738
8515192
7926
51091152 × 12
613093824
613093824
67491411792 *Ans.*

22.

23791 × ·002

3	47·582
10	15·8607
10	1·5860
	·1586
10000	65·1873
	·0065

65·1808 × ·01⅓
21·7269
Ans. ·869077

21 *cont.* (ii.) $77{\cdot}92 \times 1\frac{1}{3}$

$25{\cdot}97\frac{1}{3}$

Ans. $103{\cdot}89\frac{1}{3}$

23. $4)27028 \mid 3)21669$

$6757 \mid 7223 \mid 31$

$2)466 \mid 699$

$233 \mid 233$

24. One no. $= \sqrt{9801} = 99$; the other $= 294426 \div 99$:

$2944{\cdot}26$

$29{\cdot}443$

$\cdot294$

$\cdot003$

Ans. $2974{\cdot}000$

25. 87 at 13*s.* $2\frac{1}{4}$*d.*

240	£158	5*s.*	0*d.*
$60 = \frac{1}{4}$	39	11	3
$24 = \frac{1}{10}$	15	16	6
$3 = \frac{1}{20}$	1	19	$6\frac{3}{4}$

Ans. £57 7*s.* $3\frac{3}{4}$*d.*

26. $237061\frac{1}{8}$

6

$142237 \times \cdot002$

3	284·474
10	94·825
10	9·482
	·948
10000	389·729
	·039

389·69 *Ans.*

27. $43{\cdot}54\frac{5}{8}$*s.*

$6\frac{5}{8}$

$8)261{\cdot}29$

$32{\cdot}66\frac{1}{8}$

$293{\cdot}95\frac{1}{8}$

230

881850

58790287

$67608{\cdot}787s. \div 365$

continued.

27 *cont.* $67608{\cdot}79s. \times \cdot002$

3	135·2176
10	45·0725
10	4·5072
	·4507
10000	185·2480
	·0185

$185{\cdot}2295s.$

12

$2{\cdot}7540d.$

Ans £9 5*s.* $2\frac{3}{4}$*d.*

28. (i.) 93 at 66*s.* $9\frac{3}{4}$*d.*

240	£801	15*s.*	0*d.*
$60 = \frac{1}{4}$	200	8	9
$30 = \frac{1}{8}$	100	4	$4\frac{1}{2}$
$3 = \frac{1}{10}$	10	0	$5\frac{1}{4}$

Ans. £310 13 $6\frac{3}{4}$

(ii.) 511 at 37*s.* 8*d.*

240	£452		
240	452		
$30 = \frac{1}{8}$	56	10	0
1	1	17	8

Ans. £962 7*s.* 8*d.*

29. $9)123456789$

$13717421 \times 625 \times 4$

$4)1371742100 \times 25$

34293552500 *Ans.*

30. (i.)
123741
147321
866187
371223 × 7
2598561
1732374 = 7 times × 2
18229647861 *Ans.*

(ii.) 4)11925
Ans. 2981¼

31. $\frac{426}{506}$ or $\frac{107}{95}$ or $1\frac{8}{95}$ of £15 16*s.* 9½*d.*

£15 16*s.* 9½*d.* × 8

1	5	7	
Ans. £17	2*s.*	4½*d.*	

11)126 14 4
9)11 10 4¾
£1 5*s.* 7*d.*

32.

9729	13113	1	
8)3384	9729	23	
G.C.M. 423	846		
	1269		

2)113646

423	56823	134
	423	
	1452	
	1269	
	1833	
	1692	
Ans. 141	423	3

33. $\frac{5 \times 59}{100} = \frac{60-1}{20} = 3 - \frac{1}{20}$;

20)£1385 15*s.* 11*d.* × 3

4157	7	9	
69	5	9½	
£4088	1	11½	

divided by 365,
= £4088 ÷ 365;

£4088 × ·002

3	8·176
10	2·7253
10	·2725
	·0273
10000	11·2011
	·0011
Ans.	£11·2000

34.
364·775 × ·04
14·59100
379·36600
15·17464
394·54064

394·54064 × ·04
15·78162
410·32226
364·775
£ 45·54726 *Ans.*

35.

7·32	392·223
7·32	·5236
8784 × 6	1568892 × 3
52704	4706676 × 3
53·5824	14120028
7·32	205·3679628
6429888 × 6	or 205·368 c. ft. *Ans.*
38579328	
392·223168	

36. (i.) 215 at £2½ = £26 17*s.* 6*d.*
at ⅛*d.* = 26⅞*d.* = 0 2 3
Ans. £26 15*s.* 3*d.*

(ii.) ⅜ at £117 12*s.* 6*d.*
3
8)352 17 6
Ans. £ 44 2*s.* 2¼*d.*

37

277·274 c. in.	11)877572·210
3165	7)79779·2918
831822 × 5	12)11397·0417
4159110	12)949·7535
4159110	79·146 in.
877572·210	or 6 ft. 7·146 in. *Ans.*
11 × 7 × 1728	

38

544 times 1483*s.* 10½*d.*

240	£17806·5
240	17806·5
40 = ⅛	2967·75
24 = 1/10	1780·65
	40361·4 × ·03
	1210·842 ÷ 365

1210·84 × ·002

3	2·4217
10	·8072
10	·0807
	·0081
10000	3·3177
	·0003

Ans. £3·3174

39. 117½/99 of £391
= 1/99 of 391 times 2350*s.*

240	£28200
120 = ½	14100
30 = ¼	3525
1	117·5

459·425
4·59425
·04594
·00046
464·06565
or £464·065

1/99 of £45942·5 = £464 1*s.* 3¾*d.* Ans.

40. (i.) 504 at 7*s.* 8½*d.*

240	£92 10*s.*
240	92 10
24 = 1/10	9 5
Ans.	£194 5*s*

(ii.) 154 at 13*s.* 6¾*d.*

240	£162	15*s.*	0*d.*
120 = 1/2	81	7	6
24 = 1/10	16	5	6
10 = 1/12	6	15	7½
Ans	£104	8*s.*	7½*d.*

41.

3)92463	4)156604		5)131495
30821	39151	1	833 \| 26299 \| 31
10)8330	30821	37	2499
G.C.M. 833	2499		1309
	5831		4)476 \| 833 \| 7
			Ans. 119 \| 833

42. (i.) 11¼ at 15*s.* 2¼*d.*

	11	
£8	7	0¾
¼ = 0	3	9½
Ans. £8	10*s.*	10¼*d.*

(ii.) 76 at 1*s.* 10⅜*d.*

240	£22	7*s.*	6*d.*
60 = ¼	5	11	10½
15 = ¼	1	7	11⅝
1	0	1	10⅜
Ans.	£7	1*s.*	8½*d.*

43.

£1236·9
1/20 = 61·845
1298·745
64·93725
1363·68225
68·18411
1431·86636
71·59332
£1503·45968
9·1936*s.*
Ans. £1503 9*s.* 2·32*d.*

44. 217/365 of 163 oz. of tea

217
1141
3423
35371 × ·002

3	70·742
10	23·5806
10	2·3581
	·2358
10000	96·9165
	·0097
Ans.	96·9068

45.

10	1·0
8	·1
11	·0125
14	·001136
17	·000081
	·000005
Ans.	·113722

46.

2)5630
2815 × 7
19705
2054·95
20·55
·20
2075·70

47. 8317*s.* 3*d.*

343 times £998·07 × $2\frac{1}{4}$

	998·07
	249·5175
240	2245·6575
$40 = \frac{1}{6}$	374·2762
$60 = \frac{1}{4}$	561·4144
$3 = \frac{1}{20}$	28·0707
	3209·4188

3209·42 × ·002

3	6·41884
10	2·13961
10	·21396
	·02140
10000	8·79381
	·00088
	8·79293

Ans. £8 15*s.* 10 3*d.*

48. (i.) $7\frac{5}{8}$ at £1 10*s.* 5*d.*

	3	0	10 = 2 times
8)	7	12	1 = 5 times
	0	19	0 = $\frac{1}{8}$ of 5 times

Ans. £11 11*s.* 11*d.*

(ii.) $9\frac{5}{12}$ at 12*s.* $5\frac{1}{2}$*d.*

	2	9	10 = 4 times
12)	3	2	$3\frac{1}{2}$ = 5 times
	0	5	$2\frac{1}{4}$ = $\frac{1}{12}$ of 5 times

Ans. £5 17*s.* $3\frac{3}{4}$*d.*

49. 89102 × ·003

5	267·306
100	53·461
10	·535
−10	·053
	321·355
	·005

Ans. 321·35 gall.

50. Wt. of 1 gall. = $\frac{277274}{12 \times 12 \times 12}$ oz.

= 160·45949 oz.

= 10·028718 lb.

= ·0044771 ton

5617

313397 × 8

44771

2507176

Ans. 25·1478707 tons

51. £159·2292

$5 = \frac{1}{20}$	7·9614
$1 = \frac{1}{100}$	1·5923
	168·7829
	8·4391
	1·6878
	178·9098
	8·9455
	1·7891

Ans. £189·6444

or £189 12*s.* 10·6*d.*

52. $\frac{336}{365}$ of 11·27 ac.

336

3381 × 12

40572

3786·72 × ·002

3	7·57344
10	2·52446
10	·25245
	·02524
10000	10·37559
	·00104

Ans. 10·37455 ac.

53.

3)3198		
1066	2002	1
9)936	1066	10
104	1040	
g.c.m. 26	104	4

2)26
Ans. 13)4745
365

54.
$$\frac{125}{121}\text{ of }1\frac{123}{99999}\text{ of }4768\frac{406}{999}$$
$$=\frac{125}{121}\text{ of }\frac{814}{813}\text{ of }\frac{4768\times(1000-1)+406}{999}$$
$$=\frac{125}{11}\text{ of }\frac{74}{813}\text{ of }\frac{4768000-4362}{999}$$
$$=\frac{125}{11}\text{ of }\frac{2}{813}\text{ of }\frac{4763638}{27}=\frac{1000}{4\times813}\text{ of }\frac{433058}{27}$$
$$=\frac{1000}{12}\text{ of }\frac{1598}{27}=\frac{1598000}{4\times9\times9}=4932\frac{8}{81}.\ \textit{Ans.}$$

55.

1 ton = 2240 lb.
16
35840 oz.
an oz. = 1·728 c. in.
35840
250880 ×4
1003520
1 ton = 61931·520 c. in.

61931·52 × ·003

5	185·794
100	37·159
10	·372
−10	·037
	223·362
	·004

Ans. 223·358 gall.

56.

2)564930
282465 × 7
1977255
20619945
$3986\frac{4}{11}$
Ans. $20615958\frac{7}{11}$

3946·50
39·465
·3946
·0040
3986·36

57. (i.) $63\frac{1}{4}$ at $19\frac{1}{4}d.$ a doz.

12)£19 5*s.* 0*d.*

240	£1	12	1
$60=\frac{1}{4}$	0	8	0·25
$3=\frac{1}{20}$	0	0	4·80
$\frac{1}{4}=\frac{1}{12}$	0	0	0·40
	£0	8*s.*	5·46*d.*

Ans. 8*s.* $5\frac{1}{2}d.$

(ii.) $17\frac{7}{8}$ at $35\frac{3}{4}d.$ a doz.
$1\frac{1}{2}$ doz. $-\frac{1}{96}$ of a doz.
will cost $1\frac{3}{4}$ of 2*s.* $11\frac{3}{4}d.$
$-\frac{1}{96}$ of 143 farthings
2*s.* $11\frac{3}{4}d.$
$\frac{1}{2}=1\quad 5\frac{3}{4}$
4*s.* $5\frac{1}{2}d.$
$-\quad\frac{1}{4}d.$
Ans. 4*s.* $5\frac{1}{4}d.$

58.

20)7·41666*s.*

£93·370833

$2\frac{1}{2} = \frac{1}{40}$ = 2·334271

$1 = \frac{1}{100}$ = ·933708

96·638812

2·415970

·966388

100·021170

100·02117

$\frac{1}{40}$ = 2·50053

$\frac{1}{100}$ = 1·00021

103·52191

2·58805

1·03522

107·14518

Ans. £107 2*s.* 10·84*d.*

59.

15 + 31 + 27 + 366 = 439 days;

$\frac{439}{365}$ of $\frac{£251·25}{30}$ = £8·375 × $(1\frac{1}{5} + \frac{1}{365})$;

·002

3 | ·01675

10 | ·00558

10 | ·00056

·00006

£8·375 × $\frac{1}{365}$ = ·02295

ditto × 1·2 = 10·05

Ans. £10·07295 = £10 1*s.* 5$\frac{1}{2}$*d.*

60.

479

896

3832 × 12

45984

Ans. 4·29184 ac.

4

1·16736 ro.

40

6·69440 po.

or 4 ac. 1 ro. 6·7 po.

61.

$\frac{381·52}{75}$ of 7·385

= $\frac{381·52}{15}$ of 1·477

= 1·477 × 25·434$\frac{2}{3}$

1·477

·492$\frac{1}{3}$

·492$\frac{1}{3}$

178·038

1780·38

35607·6

Ans. 37·567

62. $\frac{364}{365}$ of £48·3 = £48·3 − $\frac{1}{365}$ of £48·3;

48·3 × ·002

3 | ·0966

10 | ·0322

10 | ·00322

·00032

·13234

£48·3

·13234

Ans. £48·16766

or £48 3*s.* 4·24*d.*

63. $\frac{276}{36\frac{1}{2}}$ of £9 14*s.* 2½*d.*

$= \frac{276}{365}$ of 10 times 194*s.* 2½*d.*

240	£23302·5
24 = $\frac{1}{10}$	2330 25
12 = $\frac{1}{2}$	1165·125
	£26797·875

to be divided by 365;

26·797875 × 2

3	53·595750
10	17·865250
10	1·786525
	·178652
10000	73·426177
	·007343
	£73·418834

Ans. £73 8*s.* 4·52*d.*

64. (i.) 77⅞ at £6 17*s.* 9*d.*

		7
48	4	3
		11½
530	6	9
6	0	6¼

Ans. £536 7*s.* 3¼*d.*

(ii.) 58¼ at 4*s.* 4½*d.*

= 233 at 1 1½

12)£11 13*s.* 0*d.*

8) 0 19 5

0 2 5

Ans. £12 14*s.* 10*d.*

65. 11·1666*s.*

£1056·55833 × ·03

31·69675

$\frac{1}{400}$ = 2·64140

1090·89648

32·72689

2·72724

1126·35061

1126·35061 × ·03

33·79052

$\frac{1}{400}$ = 2·81588

1162·95701

1056·55833

£ 106·39868

Ans. £106 7*s.* 11·68*d.*

66. (i.) 12)214·5

17·875 doz.

40

715·000*d.*

$\frac{6}{12} = \frac{1}{2}$ = 8·937

$\frac{1}{12} = \frac{1}{6}$ = 1·490

12)725·427*d.*

Ans. 60*s.* 5·43*d.*

(ii.) 12)147

12¼ doz. at 5⅜*d.*

= 5⅜ doz. at 1*s.* 0¼*d.*

= 5⅜*s.* + ½ of 5⅜*d.*

= 5*s.* 4½*d.*

+ 0 1¼

Ans. 5*s.* 5¾*d.*

67. $\frac{4653}{12\times12\times12}$ of 277·274 c. ft.

4653
517
1940918
277274
1386370
12)143350·658
16)11945·888
746·618
= 9·07 ft. *Ans.*

68. $\frac{193}{225}$ of 616*s.* $5\frac{1}{4}$*d.*

$= \frac{193}{75}$ of 205*s.* $5\frac{3}{4}$*d.*

240	£2465·75
120 = ½	1232·875
60 = ¼	616·437
12 = $\frac{1}{5}$	123·287
1 = $\frac{1}{12}$	10·274
75)	1982·873
	19·829
	6·609

Ans. £26 8*s.* 9*d.* = £26·438

69. ·1 05²−1·1) of the principal = £13·5;
1·1025−1·1 = ·0025;
hence, £13·5 ÷ ·0025
= £135000 ÷ 25;
·04
£5400·00
Ans. £5400

70. $\frac{163853\times9800\div99}{}$

1638530000
− 32770600
16057594·00
160575·94
1605·76
16·05
·16
Ans. 16219791·91

71. (i.) $26\frac{3}{8}$*s.* = £1 6*s.* $4\frac{1}{2}$*d.*
$\frac{1}{12}$ of $26\frac{3}{8}$*d.* = 0 0 $2\frac{1}{4}$
Ans. £1 6*s.* $2\frac{1}{4}$*d.*

(ii.) $17\frac{3}{4}$ at $71\frac{3}{4}$*d*

12	„	= £3	11*s.*	9*d.*
6	„	= 1	15	$10\frac{1}{2}$
		5	7	$7\frac{1}{2}$
$-\frac{1}{4}$	„	0	1	6

Ans. £5 6*s.* $1\frac{1}{2}$*d.*

72. 331² × ·7854 × 191

70686
7854
150·0114
4500342
4500342
49653·7734
1489613202
1489613202
16435398·9954 c. in.

16435399 × ·003

5	49306·197
100	9861·239
10	98·612
−10	9·861
	59275·909
	·986

Ans. 59274·923 gall.

73. Buys 68 copies for $\frac{75}{100}$ of $\frac{13s.}{2} \times 63 = \frac{1}{8}$ of $(39s. \times 63)$;
sells 68 for $\frac{1}{8}$ of $2457s. + 32\frac{7}{8}s. = 340s.$,
which is $5s.$ a copy, or $1s.$ $6d.$ discount on $6s.$ $6d.$,
$= \frac{1\frac{1}{2}}{6\frac{1}{2}}$ or $\frac{3}{13}$ of 100 on $100 = 23\frac{1}{13}$ per cent. *Ans.*

74.

3	20
5	·666667
7	·133333
9	·019047
11	·002116
13	·000192
15	·000015
	·000001
Ans.	2·821371

75. $\frac{23{\cdot}456}{99}$ of $70 = \frac{1641{\cdot}92}{99}$

16·4192
·1642
·0016
Ans. 16·5850

76. Edge of cube $= \sqrt[3]{(5{\cdot}12 \times 3{\cdot}75 \times 2{\cdot}43)}$
$= \frac{1}{100}$ of $\sqrt[3]{(512 \times 125 \times 729)} = \frac{1}{100}$ of $8 \times 5 \times 9$
$= 360 \div 100 = 3{\cdot}6$ in. *1st Ans.*

Original surface $= 5{\cdot}12 \times 2\,(3{\cdot}75 + 2{\cdot}43) + 2\,(3{\cdot}75 \times 2{\cdot}43)$
$= 5{\cdot}12 \times 12{\cdot}36 + 2{\cdot}43 \times 7{\cdot}5$

14832 24300
6180 6075

$63{\cdot}2832 + 18{\cdot}225 = 81{\cdot}5082$ sq. in.

Surface of cube $3{\cdot}6^2 \times 6 = 77{\cdot}76$

Surface of cube less by 3·7482 sq. in. *2nd Ans.*

77. ? calico = 365 flannel
1308 flannel = 1025 linen
427 linen = 1595 calico

1595
1025
39875
1595
1634875

$\frac{1595 \times 1025 \times 365}{109 \times 12 \times 7 \times 61}$
$= Ans.$

2)16348750
8174375 × 7
57220625
12)596729375
7)49727448
6649)7103921
Ans. 1068·42 — yds.

78. The weight, viz. 112 lb. × 1125, will be equal to
$62\frac{1}{2}$ lb. $\times 32 \times 18\frac{3}{4} \times$ the depth in feet;

$$\therefore \text{depth} = \frac{1125 \times 112 \times 6}{32 \times 56 \times 125} = \frac{9 \times 2 \times 6}{32} = 3\tfrac{3}{8} \text{ ft. } Ans.$$

79. No. of days from beginning of July to end of December
$= 31 + 31 + 30 + 31 + 30 + 31 = 184$;

$\frac{5}{3300}$ of 24 hrs. $\times 184 = (184 \times 1{\cdot}2) \div 99$
$73{\cdot}6$ hrs. $\div 33 = 73$ hrs. 36 min. $\div 33$
$= 24$ hrs. 32 min. $\div 11 = 2$ hrs. $13\frac{9}{11}$ min. *Ans.*

80. The actual consumption $= \frac{100}{117\frac{1}{2}}$ of 11280 c. ft.; therefore the amount that ought to be charged is

$3s.\ 9d. \times \frac{40}{47}$ of $11{\cdot}28 = 3s.\ 9d. \times 4 \times 2{\cdot}4$
$= 15s. \times 2{\cdot}4 = 36s.$ *Ans.*

81. ? c. in. copper = 963 iron
1460 iron = 986 lead
3257 lead = 4214 copper

$\frac{986 \times 963 \times 4214}{1460 \times 3257}$
$= Ans.$

$= (493 \times 963 \times 2107) \div (365 \times 3257)$

493	3257)1000317213
963	$307128{\cdot}4 \times {\cdot}002$
4437	3 \| 614·2568
31059	10 \| 204·7522
474759×2107	10 \| 20·4752
474759	2·0475
474759	10000 \| 841·5317
3323313	·0841
1000317213	*Ans.* 841·4476

82. Square of the required side $= \frac{1171{\cdot}24}{693}$ of 40^2

$= (16732 \times 16) \div 99$
$= 267712 \div 99$

$2677{\cdot}12$
$26{\cdot}7712$
$\cdot 2677$
$\cdot 0027$

$\sqrt{2704{\cdot}16} = 52$ in. *Ans.*

83. Width $= \sqrt{(\frac{1}{2}\text{ of }60\frac{1}{2})} = 5\frac{1}{2}$ yds.; $\therefore$ length $= 11$ yds.
Circuit of walls $= (11 + 5\frac{1}{2}) \times 2 = 33$ yds.
$3s.\ 5\frac{1}{2}d. \times 33 \times 5\frac{1}{2} = £2\ 15s.\ 4d. \times 11 = £30\ 8s.\ 8d.$ *Ans.*

84. $\left(\frac{7}{122\frac{1}{2}} - \frac{5\frac{1}{4}}{105}\right)$ of the capital $= £34\frac{21}{40}$,
that is, $(\frac{2}{35} - \frac{1}{20})$ of the capital $= \frac{1}{40}$ of £1381;
or $(\frac{1}{7} - \frac{1}{7})$ of it $= £1381$;
hence $£1381 \div \frac{2}{7} = £4833\ 10s.$ *Ans.*

85. $\frac{97\frac{1}{2}}{100}$ of the invoice price is to be $\frac{112\frac{1}{2}}{100}$ of $17\frac{1}{3}s.$;

$\therefore$ invoice price $= \frac{112\frac{1}{2}}{97\frac{1}{2}}$ of $\frac{52s.}{3} = 20s.$ *Ans*

86. $100 \times \left(\frac{99\frac{1}{2}}{100} \text{ of } \frac{103}{100}\right)^3 - 100 = (1{\cdot}02485^3 - 1) \times 100$

512425	1·0503175
819880	1·02485
2459640	52515875
102485	84025400
1·0503175225	252076200
	10503175

Ans. 7·6418 per cent. $= (1{\cdot}076418 - 1) \times 100$

87. The altitude is equal to half the base; $\therefore$ 99^2 is equal to twice the square of the altitude; hence the square root of $\frac{1}{2}(9900 - 99) = \sqrt{4900{\cdot}5} = 70$ almost exactly. *Ans.*

88.

10201	162150
× 9	15
9	137
83	1234
747	11111

The G.C.M. of 6724 and 99999 is 41;

the denary form of the fraction, therefore, in lowest terms is $\frac{164}{2439}$; and we transform the terms to the nonary form as follows:—

9)164	9)2439
9)18 . . . 2	9)271 . . . 0
2 . . . 0	9)30 . . . 1
	3 . . . 3

Hence $\frac{202}{3310}$ nonary. *Ans.*

89. 45

$\frac{1}{2}(25 + 29 + 36) = 45$

$\sqrt{(20 \times 16 \times 9 \times 45)} = 10 \times 4 \times 9$

$= 360$, the area. 1*st Ans.*

Now, the base A C multiplied by B D is equal to twice *the area* $= 720$; $\therefore$ $720 \div 36 = 20$. 2*nd* Ans.

90. The product of the other nos. $= \frac{782775}{256} \div \frac{71}{4} = \frac{11025}{64}$; and if the smaller no. be called m, the larger $= \frac{1}{m}$ of $\frac{11025}{64}$.

Now $\frac{1}{m}$ of $\frac{11025}{64}$ is not $> \frac{49}{16}$ of m;

hence $\frac{11025}{64}$ is not $> \frac{49}{16}$ of m^2;

$\therefore \frac{105}{8} \times \frac{4}{7}$, or $7\frac{1}{2}$, is not $> m$.

Again: $\frac{1}{m}$ of $\frac{11025}{64}$ is not $< \frac{9}{4}$ of m;

hence $\frac{11025}{64}$ is not $< \frac{9}{4}$ of m^2;

$\therefore \frac{105}{8} \times \frac{2}{3}$, or $8\frac{3}{4}$, is not $< m$.

Wherefore, since $7\frac{1}{2}$ is not $> m$, and $8\frac{3}{4}$ is not $< m$, the limits for the least number are $7\frac{1}{2}$ and $8\frac{3}{4}$. *Ans.*

91. The present value of the prime cost at the moment of sale is $\frac{100}{101\frac{1}{4}}$ or $\frac{80}{81}$ of 13*s.* 6*d.* = 13*s.* 4*d.*;

$\frac{109\frac{1}{11}}{100}$ of $13\frac{1}{3}s. = \frac{12}{11}$ of $13\frac{1}{3}s. = 14\frac{6}{11}s.$ the present value of the selling price at the same moment; hence the amount of 100 for the time sought—

$$= \frac{14\frac{2}{3}}{14\frac{6}{11}} \text{ of } 100 = \frac{44 \times 11}{160 \times 3} \text{ of } 100 = 100\frac{5}{6};$$

and $\frac{5}{6}$ is the interest on 100 for 2 months. *Ans.*

92. Volume of earth before removal $= \frac{100}{106\frac{1}{4}}$ or $\frac{16}{17}$ of 5136 cubic feet; therefore the depth

$$= \frac{16}{17} \text{ of } \frac{5136}{53\frac{1}{2} \times 12\frac{1}{2}} = \frac{16}{17} \text{ of } \frac{96 \times 2}{25} = \frac{16}{17} \text{ of } 7{\cdot}68 \text{ ft.};$$

17)7·68
·45
7·23 ft. *Ans.*

93. Cost of the mixture per gallon = $531\frac{1}{4}s. \div 25 = 21\frac{1}{4}s.$ $\therefore$ the quantity at the higher price was to the other quantity as $21\frac{1}{4} - 19 : 25\frac{1}{4} - 21\frac{1}{4}$, or as $2\frac{1}{4}$ to 4; and 25 gallons divided in that proportion gives 9 gallons of the better quality Ans.

94. Sum of the diameters $= 34{\cdot}15 \times 2 = 68{\cdot}3$ inches and their ratio $= 1 : \sqrt{3}$, or $1000 : 1732$; hence $\frac{1000}{2732}$ of $68{\cdot}3 = 68300 \div 2732 = 25$ in. the less diameter, and $68{\cdot}3 - 25 = 43{\cdot}3$ in. the greater. *Ans.*

95. To get the square root of $2523\frac{4323}{6666}$, let us first seek the G.C.M. of the terms of the fraction: this is found to be 165 *septenary*, as worked out in the annexed operation; and cancelling it from the given fraction gives $\frac{22}{34}$. The remainder of work gives the following successive results:—

4323	6666	1
2343	4323	1
10)1650	2343	12
G.C.M. 165	165	
	363	

$$\sqrt{2523\tfrac{22}{34}} \text{ sept.} = \frac{\sqrt{126100}}{\sqrt{34}} = \frac{310}{5} = 42{\cdot}5412. \quad \textit{Ans.}$$

96. The required area $= \frac{132^2}{365^2}$ of 27132

	132
	325584
	325584
2)3650	3581424 × 132
1825 × 7	42977088
12775	42977088
1332·25	4727479·68
5329	18909918
	3548·5 *Ans.*

97. 11·4 units silver + 2·6 units gold = 14 units mixture.

$11{\cdot}4 \times {\cdot}135 = 1{\cdot}539$ units dross in silver,
$2{\cdot}6 \times {\cdot}1735 = {\cdot}4511$ „ „ in gold,
$1{\cdot}99$ „ „ in mixture;

that is, very nearly 2 units in 14;

$\therefore$ $\frac{1}{7}$ of $100 = 14\frac{2}{7}$ per cent. *Ans.*

98. Let d denote the depth in inches:

$60 \times 42 \times \frac{1}{2000}$ of $d = \frac{1}{4}$ of $277{\cdot}274$
or $60 \times 42 \times d = 277{\cdot}274 \times 500 = 500$ gall.;

$$d = \frac{277{\cdot}274 \times 500}{60 \times 42} = \frac{277{\cdot}274 \times 25}{126}$$

$$= \frac{6931{\cdot}85}{126} = 55{\cdot}015 \text{ in. or } 4 \text{ ft. } 7{\cdot}015 \text{ in. } \textit{Ans.}$$

99. If A does a units of work in an hour, and B does b such units, B could do a units in $\frac{a}{b}$ of an hour, and A could do b units in $\frac{b}{a}$ of an hour;

$$\therefore \frac{b}{a} = \cdot 9604 \text{ of } \frac{a}{b}, \text{ or } \left(\frac{b}{a}\right)^2 = \cdot 9604,$$

$$\text{and } \therefore \frac{b}{a} = \sqrt{\cdot 9604} = \cdot 98;$$

hence $a : b :: 1 : \cdot 98$ or as $50 : 49$;

but $a + b = \frac{1}{77}$ of the whole work; therefore,

$$\text{A does } \frac{50}{99} \text{ of } \frac{1}{77} = \frac{50}{99 \times 77} \text{ or } \frac{100}{15246} \text{ per hour,}$$

$$\text{B does } \frac{49}{99} \text{ of } \frac{1}{77} = \frac{49}{99 \times 77} \text{ or } \frac{7}{1089} \text{ per hour;}$$

so that A could do the whole in $15246 \div 100 = 152 \cdot 46$ hours, and B the whole in $1089 \div 7 = 155\frac{4}{7}$ hours. *Ans.*

100. Call the loan m: it amounted by compound interest to $m \times 1 \cdot 05^3$; and the annual premium of £20 amounted to $(1 \cdot 05^3 + 1 \cdot 05^2 + 1 \cdot 05) \times 20$; and the sum of these two amounts is to be equal to £737·625.

$$\begin{array}{r} 1 \cdot 05 \\ \cdot 0525 \\ \hline 1 \cdot 1025 \\ \cdot 055125 \\ \hline m \times 1 \cdot 157625 + 3 \cdot 310125 \times 20 = 737 \cdot 625 \\ 66 \cdot 2025 \\ \hline m \times 1 \cdot 157625 = 671 \cdot 4225 \end{array}$$

whence $m =$ £580. *Ans.*

LONDON: PRINTED BY
SPOTTISWOODE AND CO., NEW-STREET SQUARE
AND PARLIAMENT STREET

SELECT GENERAL LISTS
OF
SCHOOL-BOOKS
PUBLISHED BY
MESSRS. LONGMANS AND CO.

☞ The School-Books Atlases, Maps, &c. comprised in this Catalogue may be inspected in the Educational Department of Messrs. LONGMANS and Co. 39 Paternoster Row, E.C. London, where also all other works published by them may be seen.

English Reading-Lesson Books.

Illustrated Readers in *Longmans' Modern Series*:—
Introductory Primer, pp. 24, with Woodcuts, fcp. 8vo. price 2*d.* sewed.
Fourteen Reading-Sheets from the Primer, 3*s.* 6*d.* per Set.
Primer, pp. 64, with numerous Woodcuts, 3*d.* sewed, 4*d.* cloth
Book I. pp. 90, with numerous Woodcuts, cloth 6*d.*
Book II. pp. 128, with numerous Woodcuts, cloth 8*d.*
Book III. pp. 192, with numerous Woodcuts, cloth 1*s.*
Book IV. pp. 256, with numerous Woodcuts, cloth 1*s.* 4*d.*
Book V. pp. 320, with numerous Woodcuts, cloth 2*s.*
Shakespeare's *Julius Cæsar*, Notes by T. Parry & Woodcuts, 12mo. 1*s.*
Selections from Shakespeare's *Julius Cæsar*, 12mo. 3*d.*
Shakespeare's *Merchant of Venice*, Notes by T. Parry & Woodcuts, 12mo. 1*s.*
Selections from Shakespeare's *Merchant of Venice*, 12mo. 3*d.*
Swift's Gulliver's Travels, Lilliput and Brobdingnag, Notes by Parry & Woodcuts, 12mo. 1*s.*

Isbister's First Steps in Reading and Learning, 12mo 1*s.* 6*d.*

Laurie & Morell's Graduated Series of Reading-Lesson Books:—

Morell's Elementary Reading Book or Primer, 18mo. 1*d.*

Book I. pp. 144 3*d.*
Book II. pp. 254 1*s.* 3*d.*
Book III. pp. 312 1*s.* 6*d.*
Book IV. pp. 440 2*s.*
Book V. comprehending Readings in the best English Literature, pp. 496 2*s.* 6*d.*

M'Leod's Reading Lessons for Infant Schools, 30 Broadside Sheets 8*s.*
— First School-Book to teach Reading and Writing, 18mo. 6*d.*
— Second School-Book to teach Spelling and Reading, 18mo. 9*d.*

Stevens's Domestic Economy Series for Girls:—
Book I. for Girls' Fourth Standard, crown 8vo. 2*s.*
Book II. for Girls' Fifth Standard, crown 8vo. 2*s.*
Book III. for Girls' Sixth Standard, crown 8vo. 2*s.*

Stevens & Hole's Introductory Lesson-Book, 18mo. 6*d.*

Stevens & Hole's Grade Lesson-Book Primer, crown 8vo. 3*d.*

Stevens & Hole's Grade Lesson Books, in Six Standards, 12mo.:—
The First Standard, pp. 128 ... 9*d.*
The Second Standard, pp. 160 9*d.*
The Third Standard, pp. 160 ... 9*d.*
The Fourth Standard, pp. 224 ... 1*s.* 3*d.*
The Fifth Standard, pp. 224 ... 1*s.* 3*d.*
The Sixth Standard, pp. 260 ... 1*s.* 6*d.*
Answers to the Arithmetical Exercises in Standards I. II. and III. price 4*d.* in Standard IV. price 4*d.* in Standards V. and VI. 4*d.* or complete, price 1*s.* 2*d.*

Jones's Secular Early Lesson-Book, 18mo. 6*d.*
— Secular Early Lesson-Book. Part II. Proverbs 4*d.*
— Advanced Reading-Book; Lessons in English History, 18mo. 10*d.*

Sullivan's Literary Class-Book; Readings in English Literature, fcp. 2*s.* 6*d.*

Writing Books.

Isbister's Three Engraved Account Books, oblong 4to. each 1s.
Johnston's Civil Service Specimens of Copying MSS. folio 2s. 6d.
M'Leod's Graduated Series of Nine Copy-Books each 2d.
Tidmarsh's Copy-Books in *Longmans' Modern Series*, the Set of Twelve Copy-Books, price each 2d.

School Poetry Books.

Booth's Poetical Reader in *Longmans' Modern Series*, fcp. 8vo. with numerous Woodcuts, 1s. 6d. cloth, or with gilt edges 2s.
Bilton's Poetical Reader for all Classes of Schools, fcp. 1s. 6d.
Byron's Childe Harold, annotated by W. Hiley, M.A. fcp. 8vo. 1s. 6d.
Hughes' Select Specimens of English Poetry, 12mo. 3s. 6d.
Hunter's Plays of Shakespeare, with Explanatory Notes, each Play 1s.

All's Well that ends Well.	Julius Cæsar.	Othello.
Antony and Cleopatra.	King John.	Richard II.
As You Like it.	King Lear.	Richard III.
Comedy of Errors.	Love's Labour's Lost.	Romeo and Juliet.
Coriolanus.	Macbeth.	Taming of the Shrew.
Cymbeline.	Measure for Measure.	The Tempest.
Hamlet.	Merchant of Venice.	Timon of Athens.
Henry IV. 2 Parts.	Merry Wives of Windsor.	Troilus and Cressida.
Henry V.	Midsummer Night's Dream.	Twelfth-Night.
Henry VI. 3 Parts.	Much ado about Nothing.	Two Gentlemen of Verona.
Henry VIII.		Winter's Tale.

Macaulay's Lays of Ancient Rome, with *Ivry* and *The Armada*, fcp. 8vo. 1s. sewed, 1s. 6d. cloth, or 2s. 6d. cloth extra, with gilt edges.
M'Leod's First Poetical Reading Book, fcp. 8vo. 9d.
— Second Poetical Reading Book, fcp. 8vo. 1s. 6d.
M'Leod's Goldsmith's Deserted Village, and Traveller, each Poem, 18mo. 1s. 6d.
Milton's Samson Agonistes and Lycidas, by Hunter, 12mo. 1s. 6d.
— Comus, L'Allegro and Il Penseroso, by Hunter, 12mo. 1s. 6d.
— Paradise Lost, by Hunter, I. & II. 1s. 6d. each; III. to V. 1s. each.
— Paradise Regained, by Jerram, 18mo. 2s. 6d.
Pope's Essay on Criticism & Moral Essays, by Arnold, fcp. 8vo. 1s. 6d.
Scott's Marmion, by Morris, 12mo. 2s. 6d.
Twells's Poetry for Repetition, comprising 200 short pieces, 18mo. 1s. 6d.

English Spelling-Books.

Jonnson's Civil Service Spelling Book, fcp. 1s. 3d.
Sewell's Dictation Exercises, First Series, 18mo. 1s. Second Series 2s. 6d.
Sullivan's Spelling-Book Superseded, 18mo. 1s. 4d.
— Words Spelled in Two or More Ways, 18mo. 10d.

Grammar and the English Language.

Arnold's English Poetry & Prose, crown 8vo. 6s.
— Manual of English Literature, crown 8vo. 7s. 6d.
Bain's First or Introductory English Grammar, 18mo. 1s. 6d.
— Higher English Grammar, fcp. 8vo. 2s. 6d.
— Companion to English Grammar, crown 8vo. 3s. 6d.
Brewer's Guide to English Composition, fcp. 8vo. 3s. 6d.
Campbell's English Word-Study, fcp. 8vo. 1s. 6d.
Conway's Treatise on Versification, crown 8vo. 4s. 6d.
Edwards's History of the English Language, with Specimens, 18mo. 9d.
Farrar's Language and Languages, crown 8vo. 6s.
Ferrar's Comparative Grammar, Sanskrit, Greek, Latin, Vol. I. 8vo. 12s.
Fleming's Analysis of the English Language, crown 8vo. 5s.
Graham's English, or the Art of Composition Explained, fcp. 8vo. 5s.
Hiley's Child's First English Grammar, 18mo. 1s.
Abridgment of Hiley's English Grammar, 18mo. 1s. 9d.

Hiley's English Grammar and Style, 12mo. 2s. 6d.
— Exercises adapted to his English Grammar, 12mo. 2s. 6d. Key 4s. 6d.
— Practical English Composition, Part I. 18mo. 1s. 6d. Key 2s. 6d.
— — — — Part II. 18mo. 3s. Key 4s.
Hunter's Text-Book of English Grammar, 12mo. 2s. 6d.
— Manual of School Letter-Writing, 12mo. 1s. 6d.
Isbister's English Grammar and Composition, 12mo. 1s. 6d.
— First Book of Grammar, Geography, and History, 12mo. 6d.
Johnston's English Composition and Essay-Writing, post 8vo. 2s. 6d.
Latham's Handbook of the English Language, crown 8vo. 6s.
— Elementary English Grammar, crown 8vo. 3s. 6d.
Lowres's Grammar of English Grammars, 12mo. 2s. 6d.
M'Leod's Explanatory English Grammar for Beginners, 18mo. 9d.
— English Grammatical Definitions, for Home Study, 18mo. 1d.
Marcet's Willy's Grammar for the use of Boys, 18mo. 2s. 6d.
— Mary's Grammar, intended for the use of Girls, 18mo. 1s.
Morell's Essentials of English Grammar and Analysis, fcp. 8vo. 3d.
Morgan's Learner's Companion to the same, post 8vo. 6d.
Morell's Grammar of the English Language, post 8vo. 2s. or with Exercises 2s. 6d.
— Graduated English Exercises, post 8vo. 3d. sewed or 9d. cloth.
Morgan's Key to Morell's Graduated Exercises, 12mo. 4s.
Müller's (Max) Lectures on the Science of Language, 2 vols. crown 8vo. 16s
Murison's First Work in English, fcp. 8vo. 3s. 6d.
Roget's Thesaurus of English Words and Phrases, crown 8vo. 10s. 6d.
The Stepping-Stone to English Grammar, 18mo. 1s.
Sullivan's Manual of Etymology, or First Steps to English, 18mo. 10d.
— Attempt to Simplify English Grammar, 18mo. 1s.
Wadham's English Versification, crown 8vo. 4s. 6d.
Weymouth's Answers to Questions on the English Language, fcp. 8vo. 2s. 6d.

Paraphrasing, Parsing, and Analysis.

Hunter's Indexing & Précis of Correspondence, 12mo. 3s. 6d.
— Introduction to Précis-Writing, 12mo. 2s.
— Paraphrasing and Analysis of Sentences, 12mo. 1s. 3d. Key 1s. 3d.
— Progressive Exercises in English Parsing, 12mo. 6d.
— Questions on Paradise Lost, Books I. & II. 12mo. 1s.
— Questions on the Merchant of Venice, 12mo. 1s.
Johnston on Digesting Returns into Summaries, crown 8vo. 1s. 3d.
— Civil Service Précis, 12mo. 3s. 6d.
Lowres's System of English Parsing and Derivation, 18mo. 1s.
Morell's Analysis of Sentences Explained and Systematised, 12mo. 2s.
Morgan's Training Examiner, First Course, 4d. Key, 1s Second Course, 1s.

Dictionaries and Manuals of Etymology.

Graham's English Synonyms, Classified and Explained, fcp. 8vo. 6s.
Johnson's Dictionary, by Latham, medium 8vo. 14s. 4 vols. 4to. £7.
Maunder's Scientific and Literary Treasury, fcp. 8vo. 6s.
— Treasury of Knowledge and Library of Reference, fcp. 8vo. 6s.
Sullivan's Dictionary of the English Language, 12mo. 3s.
— Dictionary of Derivations, or Introduction to Etymology, fcp. 2s.
Whately's English Synonyms, fcp. 8vo. 3s.

Elocution.

Bilton's Repetition and Reading Book, crown 8vo. 2s. 6d.
Hughes's Select Specimens of English Poetry, 12mo. 3s. 6d.

Isbister's Illustrated Public School Speaker and Reader, 12mo. 3s. 6d.
— Lessons in Elocution, for Girls, 12mo. 1s. 6d.
— Outlines of Elocution, for Boys, 12mo. 1s. 6d.
Millard's Grammar of Elocution, fcp. 8vo. 3s. 6d.
Rowton's Debater, or Art of Public Speaking, fcp. 8vo. 6s.
Smart's Practice of Elocution, 12mo. 4s.
Twells's Poetry for Repetition, 200 short Pieces and Extracts, 18mo. 1s. 6d.

Dublin University Press Series.

Abbott's Dublin Codex Rescriptus of St. Matthew 21s.
Burnside & Panton's Theory of Equations 10s. 6d.
Casey's Sequel to Euclid's Elements 3s. 6d.
Dublin Translations into Greek & Latin Verse 12s. 6d.
Graves's Life of Sir William Hamilton, Vol. I. 15s.
Griffin on Parabola, Ellipse and Hyperbola, treated geometrically 6s.
Haughton's Lectures on Physical Geography 15s.
Hobart's Medical Language of St. Luke 16s.
Leslie's Essays in Political and Moral Philosophy 10s. 6d.
Macalister's Zoology and Morphology of Vertebrata 10s. 6d.
MacCullagh's Collected Works 15s.
Maguire's Parmenides of Plato, Greek Text with English Notes 7s. 6d.
Monck's Introduction to Logic 5s.
Southey's Correspondence with Caroline Bowles 14s.
Tyrrell's Acharnians of Aristophanes 2s. 6d.
— Cicero's Correspondence, Vol. I. 12s.
Webb's Faust of Goethe, Translation and Notes 12s. 6d.

Arithmetic.

Arithmetic in Seven Standards, in *Longmans' Modern Series*:—
STANDARD I. 1½d. paper, 2½d. cloth; STANDARDS II. to V. each 2d. paper, 3d. cloth; STANDARDS VI. & VII. 3d. each paper, 4d. each cloth.
KEYS, Standards I. to VII. (*Answers*), price 2d. each.

Quarterly Arithmetical Test-Cards in *Longmans' Modern Series*:—
STANDARDS II. to VI. Packets of 24 Cards, 1s. each packet, in paper, or in cloth each 1s. 2d.

Anderson's Arithmetic for the Army, 18mo. 1s.
Colenso's Arithmetic designed for the use of Schools, 12mo. 4s. 6d.
Key to Colenso's Arithmetic for Schools, by Rev. J. Hunter, M.A. 12mo. 5s.
Colenso's Shilling Elementary Arithmetic, 18mo. 1s. with Answers 1s 6d.
— Arithmetic for National, Adult, and Commercial Schools:—
1. Text-Book, 18mo. 6d. | 3. Examples, Part II. Compound Arithmetic 4d.
2. Examples, Part I. Simple Arithmetic 4d. | 4. Examples, Part III. Fractions, Decimals & Duodecimals 4d.
5. Answers to Examples, with Solutions of the difficult Questions ... 1s.
Colenso's Arithmetical Tables, on a Card 1d.
Harris's Graduated Exercises in Arithmetic and Mensuration, crown 8vo. 2s. 6d. or with Answers, 3s. the Answers separately, 2d. Full Key 5s.
Hiley's Recapitulatory Examples in Arithmetic, 12mo. 1s.
Hunter's Modern Arithmetic for School Work or Private Study, 12mo. 3s. 6d. Key, 5s.
Hunter's New Shilling Arithmetic, 18mo. 1s. Key 2s.
— Standard Arithmetic. Three Parts, 2d. each. and Key 6d.
— Short Methods in Arithmetic, 12mo. 1s. 6d.
Isbister's Unitary Arithmetic, 12mo. 1s. or with Answers 1s. 6d.
Johnston's Civil Service Arithmetic, 12mo. 3s. 6d. Key 4s.
— Civil Service Tots, with Answers and Cross-Tots 1s.
Liddell's Arithmetic, 18mo. 1s.—or Two Parts each 6d.
Lupton's Arithmetic for Schools and Candidates for Examination, 12mo. 2s. 6d. or with Answers, 3s. 6d. the Answers separately 1s. Key 6s.
— Examination-Papers in Arithmetic, crown 8vo. 1s.
M'Leod's Manual of Arithmetic, containing 1,750 Questions, 18mo. 2d.
— Mental Arithmetic, I. Whole Numbers, II. Fractions each 1s.
— Extended Multiplication and Pence Tables, 18mo. 1d.
Merrifield's Technical Arithmetic and Mensuration, small 8vo. 3s. 6d. Key 3s. 6d.
Moffatt's Mental Arithmetic, 12mo. 1s. or with Key, 1s. 6d.
Tate's First Principles of Arithmetic, 12mo. 1s. 6d
Thomson's Arithmetic, 72d Edit. by the Author's Sons, 12mo. 3s. 6d. Key 5s.
Wooding's Four Rules of Arithmetic, fcp. 8vo. 1s. nd KEY, price 1s.

Book-keeping and Banking.

Hunter's Exercises in Book-keeping by Double Entry, 12mo. ...1s. 6d. Key 2s. 6d.
— Examination-Questions in Book-keeping by Double Entry, 12mo. 2s. 6d.
— Examination-Questions &c. as above, separate from the Answers 1s.
— Ruled Paper for Forms of Account Books, 5 sorts ... per quire, 1s. 6d.
— Self-Instruction in Book-keeping, 12mo. ... 2s.
— Studies in Double Entry, crown 8vo. ...
— Supplementary Book-keeping by Double Entry, crown 8vo. 3s
Isbister's Book-keeping by Single and Double Entry, 18mo. ... 3d.
— Set of Eight Account Books to the above ... each 6d.
Macleod's Economics for Beginners, small crown 8vo. ... 2s. 6d.
— Elements of Banking, Fourth Edition, crown 8vo. ... 5s.
— Elements of Economics, 2 vols. crown 8vo. ... Vol. I. 7s. 6d.

Mensuration.

Boucher's Mensuration, Plane and Solid, 12mo. ... 3s.
Hiley's Explanatory Mensuration, 12mo. ... 2s. 6d.
Hunter's Elements of Mensuration, 18mo. ... 1s. Key 1s.
Merrifield's Technical Arithmetic & Mensuration, small 8vo. ... 3s. 6d.
Nesbit's Treatise on Practical Mensuration, by Hunter, 12mo. 3s. 6d. Key 5s.

Algebra.

Colenso's Algebra, for National and Adult Schools, 18mo. ... 1s. 6d. Key 2s. 6d.
— Algebra, for the use of Schools, Part I. 12mo ... 4s. 6d. Key 5s.
— Elements of Algebra, for the use of Schools, Part II. 12mo. 6s. Key 5s.
— Examples and Equation Papers, with the Answers, 12mo. ... 2s. 6d.
— Student's Algebra, crown 8vo. ... 6s. Key 5s.
Griffin's Algebra and Trigonometry, small 8vo. ... 3s. 6d.
— Notes on Algebra and Trigonometry, small 8vo. ... 3s. 6d.
Lund's Short and Easy Course of Algebra, crown 8vo. ... 2s. 6d. Key 2s. 6d.
Potts's Elemetary Algebra, 8vo. 6s. 6d. or in 12 Sections, 6d. each.
Reynolds's Elementary Algebra for Beginners, 18mo. 9d. Answers, 3d. Key 1s.
Tate's Algebra made Easy, 12mo. ... 2s. Key 2s. 6d.
Wood's Algebra, modernised by Lund, crown 8vo. ... 7s. 6d.
— — Companion to, by Lund, crown 8vo. ... 7s. 6d.

Geometry and Trigonometry.

Booth's New Geometrical Methods, 2 vols. 8vo. ... 36s.
Casey's Elements of Euclid, Books I. to VI. fcp. 8vo. ... 4s. 6d.
— Sequel to Euclid, fcp. 8vo. ... 2s. 6d.
Colenso's Elements of Euclid, 18mo. 4s. 6d. or with Key to the Exercises ... 6s. 6d.
— Geometrical Exercises and Key. ... 3s. 6d.
— Geometrical Exercises, separately, 18mo. ... 1s.
— Trigonometry, 12mo. Part I. 3s. 6d. Key 3s. 6d. Part II. 2s. 6d. Key 5s.
Griffin's Elementary Treatise on Plane Geometry, crown 8vo. ... 2s. 6d.
Harvey's Euclid for Beginners, Books 1. & 11., 12mo. ... 2s. 6d.
Hawtrey's Introduction to Euclid ... fcp. 8vo. 2s. 6d.
Hunter's Plane Trigonometry, for Beginners, 18mo. ... 1s. Key 9d.
— Treatise on Logarithms, 18mo. ... 1s. Key 9d.
Isbister's School Euclid, 12mo. Book I. price 1s. Books I. & II. price 1s. 6d. Books I. to IV. price 2s. 6d.
Jeans's Plane and Spherical Trigonometry, 12mo. Part I. 5s., Part II. 4s. or the 2 Parts in 1 vol. price 8s. 6d.
Potts's Euclid, University Edition, 8vo. ... 10s.
— — Intermediate Edition, Books I. to IV. 3s. Books I. to III. 2s. 6d. Books I. II. 1s. 6d. Book I. 1s. 6d.
— Enunciations of Euclid, 12mo. ... 1s.
Salmon on Conic Sections, 6th Edition, 8vo. ... 12s.

Tate's First Three Books of Euclid, 18mo. 9d.
— Differential and Integral Calculus, 12mo. 4s. 6d.
— Geometry, Mensuration, Trigonometry, &c. 12mo. 3s. 6d.
— Practical Geometry, with 261 Woodcuts, 18mo. 1s.
Thomson's Plane and Spherical Trigonometry, 8vo. 4s. 6d.
— Differential and Integral Calculus, 12mo. 5s. 6d.
Watson's Plane and Solid Geometry, small 8vo. 3s. 6d.
Williamson on Differential Calculus, crown 8vo. 10s. 6d.
— on Integral Calculus, crown 8vo. 10s. 6d.
Wright's Elements of Plane Geometry, cr. 8vo. 5s.

Land Surveying, Drawing, and Practical Mathematics

Binns's Orthographic Projection and Isometrical Drawing, 18mo. 1s.
Hulme's Worked Questions in Geometrical Drawing, super royal 8vo. 7s. 6d.
Kimber's Graduation Mathematics, 8vo. 2s. or with Solutions, 6s. 6d.
— Mathematical Course for the University of London, 8vo. 12s.
To be had in Two Parts, 1s. 6d. each Key, in 2 Parts, 5s. each.
Milburn's Mathematical Formulæ for Candidates, post 8vo. 8s. 6d.
Nesbit's Practical Land Surveying, 8vo. 12s.
Salmon's Treatise on Conic Sections, 8vo. 12s.
Winter's Mathematical Exercises, post 8vo. 6s. 6d.
Winter's Elementary Geometrical Drawing, Part I. post 8vo. 3s. 6d. Part II. 6s. 6d.
Wright's Lessons on Form, crown 8vo. 2s. 6d.
Wrigley's Examples in Pure and Mixed Mathematics, 8vo. 8s. 6d.

Musical Works by John Hullah, LL.D.

Hullah's Method of Teaching Singing, crown 8vo. 2s. 6d.
— Exercises and Figures in the same, crown 8vo. 1s. or 2 Parts, 6d. each.
Large Sheets, containing the Exercises in the same, Nos. 1. to XL. Five Parcels of Eight Sheets each per Parcel 6s.
Chromatic Scale, with the Inflected Syllables, on Large Sheet 1s. 6d.
Card of Chromatic Scale, price 1d.
Grammar of Musical Harmony, royal 8vo. Two Parts each 1s. 6d.
Exercises to Grammar of Musical Harmony 1s.
Grammar of Counterpoint. Part I. super-royal 8vo. 3s. 6d.
Wilhem's Manual of Singing. Parts I. & II. 2s. 6d. or together 5s.
Exercises and Figures contained in Parts I. & II. Books I. & II. each 6d.
Large Sheets to Wilhem, Part I. Nos. I. to VIII. in a Parcel 6s.
— — — — IX. to XL. 4 Parcels of 8 Nos. each 6s.
— — — Part II. XLI. to LII. 9s.
Hymns for the Young, set to Music, royal 8vo. 6d.
Infant School Songs 6d.
Notation, the Musical Alphabet, crown 8vo. 6d.
Old English Songs for Schools, Harmonised 6d.
Rudiments of Musical Grammar, royal 8vo. 3s.
School Songs for 2 and 3 Voices. 2 Books, 8vo. each 6d.

Longmans' Geographical Reading Books, edited by Rudler.

Stewart's Introductory Book, fcp 8vo. 6d.
Physical Geography for Standard II. by Stewart 9d.
The British Islands, for Standard III. by T. Parry.
The Zones, Climate, Races of Mankind, &c. for Standard IV.
Europe, North America, &c. for Standard V. by Bendall.
Asia and Africa, for Standard VI. by a Lady.
South America, &c. for Standard VII.

Political and Historical Geography.

Brassey's (Lady) Voyage in the Sunbeam, School Edition, fcp. 8vo. 2s.
School-Prize Edition, with gilt edges, 3s.
Butler's Ancient and Modern Geography, post 8vo. 7s. 6d.
— *Sketch* of Modern Geography, post 8vo. 4s.
— *Sketch of* Ancient Geography, post 8vo. 4s.

Freeman's Historical Geography of Europe, 2 vols. 8vo. 31s. 6d.
Hiley's Child's First Geography, 18mo. 3d.
— Elementary Geography for Beginners, 18mo. 1s. 6d.
Hughes's Child's First Book of Geography, 18mo. 3d.
— Geography of the British Empire, for Beginners, 18mo. 9d.
— General Geography, for Beginners, 18mo. 9d. Questions, 9d.
— Manual of Geography, with Six Coloured Maps, fcp. 8vo. 7s. 6d.
Or in Two Parts:—I. Europe, 3s. 6d. II. Asia, Africa, America, &c. 4s.
Hughes's Manual of British Geography, fcp. 8vo. 2s.
Johnston's Competitive Geography of the World, post 8vo. 5s.
— — — British Isles, post 8vo. 1s. 6d.
— — Elementary Geography, fcp. 8vo. 1s. 3d.
Keith Johnston's Gazetteer, or Geographical Dictionary, 8vo 42s.
Lupton's Examination-Papers in Geography, crown 8vo. 1s.
M'Leod's Geography of Palestine or the Holy Land, 12mo. 1s. 6d.
Maunder's Treasury of Geography, fcp. 8vo. 6s.
The Stepping-Stone to Geography, 18mo. 1s.
Sullivan's Geography Generalised, fcp. 2s. or with Maps, 2s. 6d.
— Introduction to Ancient and Modern Geography, 18mo. 1s.

Physical Geography and Geology.

Cotta's Rocks Classified and Described, by Lawrence, post 8vo. 14s.
Hughes's (E.) Outlines of Physical Geography, 12mo. 3s. 6d. Questions, 6d.
— (W.) Physical Geography for Beginners, 18mo. 1s.
Keith's Treatise on the Use of the Globes, 12mo. 5s. 6d. Key 2s. 6d.
Proctor's Elementary Physical Geography, fcp. 8vo. 1s. 6d.
Woodward's Geology of England and Wales, crown 8vo. 14s.

School Atlases and Maps.

Butler's Atlas of Modern Geography, royal 8vo. 10s. 6d.
— Junior Modern Atlas, comprising 12 Maps, royal 8vo. 4s. 6d.
— Atlas of Ancient Geography, royal 8vo. 12s.
— Junior Ancient Atlas, comprising 12 Maps, royal 8vo. 4s. 6d.
— General Atlas, Modern & Ancient, royal 4to. 22s.
Public Schools Atlas of Ancient Geography, 25 entirely New Coloured Maps, imperial 8vo. or imperial 4to. 7s. 6d. cloth.
Outline Maps of Greece and Palestine from the Same, 1d. each.
Public Schools Atlas of Modern Geography, 31 entirely New Coloured Maps, imperial 8vo. or imperial 4to. 5s. cloth.
Ten Outline Maps from the Same, 1d. each.

Natural History and Botany.

Edmonds's Elementary Botany, fcp. 8vo. Woodcuts 2s.
Lindley and Moore's Treasury of Botany, Two Parts, fcp. 8vo. 12s.
Macalister's Systematic Zoology of Vertebrates, 8vo. 10s. 6d.
Maunder's Treasury of Natural History, revised by Holdsworth, fcp. 8vo. 6s.
Owen's Natural History for Beginners, 18mo. Two Parts 9d. each, or 1 vol. 2s.
— Stepping-Stone to Natural History, 18mo. 2s. 6d.
Or in Two Parts.—I. *Mammalia*, 1s. II. *Birds, Reptiles*, and *Fishes* 1s.
Wood's Bible Animals 8vo. 10s. 6d.
— Homes without Hands, 8vo. 10s. 6d.
— Common British Insects, crown 8vo. 3s. 6d.
— Insects at Home, 8vo 10s. 6d.
— Insects Abroad, 8vo. 10s. 6d.
— Out of Doors, crown 8vo. 7s.
— Strange Dwellings, crown 8vo. 5s. Popular Edition, 4to. 6d.

Chemistry and Telegraphy.

Armstrong's Organic Chemistry, fcp. 8vo. 3s. 6d.
Culley's Practical Telegraphy, 8vo. 16s.
Jago's Inorganic Chemistry, Theoretical and Practical, fcp. 8vo. 2s.
Kolbe's Inorganic Chemistry, by Humpidge
Miller's Elements of Chemistry, Theoretical and Practical, 8vo.
Part I.—Chemical Physics, Sixth Edition, 16s.
Part II.—Inorganic Chemistry, Sixth Edition, 24s.
Part III.—Organic Chemistry, Fifth Edition, 31s. 6d.
— Introduction to Inorganic Chemistry, 8vo. 3s. 6d.
Odling's Course of Practical Chemistry, for Medical Students, crown 8vo... 6s.
Preece and Sivewright's Telegraphy, crown 8vo. 3s. 6d.
Reynolds's Experimental Chemistry, PART I. 1s. 6d.; PART II. 2s. 6d.
Tate's Outlines of Experimental Chemistry, 18mo. 9d
Thorpe's Quantitative Chemical Analysis, 8vo. 4s. 6d
Thorpe and Muir's Qualitative Chemical Analysis, 8vo. 3s. 6d
Tilden's Chemical Philosophy, fcp. 8vo. 3s. 6d.
— Practical Chemistry, Principles of Qualitative Analysis, fcp. 8vo. 1s. 6d.

Natural Philosophy and Natural Science.

Bloxam and Huntington's Metals, fcp. 8vo. 5s.
Day's Electrical & Magnetic Measurement, 16mo. 2s. 6d.
Downing's Practical Hydraulics, Part I. 8vo 5s. 6d.
Everett's Vibratory Motion and Sound, 8vo. 7s. 6d.
Ganot's Physics, translated by Prof. E. Atkinson, large crown 8vo. 15s.
— Natural Philosophy, translated by the same, crown 8vo. 7s. 6d.
Helmholtz' Lectures on Scientific Subjects. 2 Series, 7s. 6d. each.
Irving's Short Manual of Heat, small 8vo. 2s. 6d.
Jenkin's Electricity & Magnetism, small 8vo. 3s. 6d.
Maxwell's Theory of Heat, small 8vo. 3s. 6d.
Tate's Light & Heat, for the use of Beginners, 18mo. 9d.
— Hydrostatics, Hydraulics & Pneumatics, 18mo. 9d.
— Electricity, explained for the use of Beginners, 18mo. 9d.
— Magnetism, Voltaic Electricity & Electro-Dynamics, 18mo. 9d.
Tyndall's Lesson in Electricity, with 58 Woodcuts, crown 8vo. 2s. 6d.
— Notes of Lectures on Electricity, 1s. sewed, 1s. 6d. cloth.
— Notes of Lectures on Light, 1s. sewed, 1s. 6d. cloth.

Text-Books of Science, Mechanical and Physical.

Abney's Treatise on Photography, fcp. 8vo. 3s. 6d.
Anderson's (Sir John) Strength of Materials 3s. 6d.
Armstrong's Organic Chemistry 3s. 6d.
Ball's Elements of Astronomy 6s.
Barry's Railway Appliances 3s. 6d.
Bauerman's Systematic Mineralogy 6s.
— Descriptive Mineralogy, *in the press.*
Bloxam and Huntington's Metals 5s.
Glazebrook's Physical Optics 6s.
Gore's Art of Electro-Metallurgy 6s.
Griffin's Algebra and Trigonometry 3s. 6d.
Jenkin's Electricity and Magnetism 3s. 6d.
Maxwell's Theory of Heat 3s. 6d.
Merrifield's Technical Arithmetic and Mensuration 3s. 6d.
Miller's Inorganic Chemistry 3s. 6d.
Preece & Sivewright's Telegraphy 3s. 6d.
Rutley's Study of Rocks, a Text-Book of Petrology 4s. 6d.

Shelley's Workshop Appliances 4s. 6d.
Thomé's Structural and Physiological Botany 6s.
Thorpe's Quantitative Chemical Analysis 4s. 6d.
Thorpe & Muir's Qualitative Analysis 3s. 6d.
Tilden's Chemical Philosophy 3s. 6d.
Unwin's Elements of Machine Design 6s.
Watson's Plane and Solid Geometry 3s. 6d.

The London Science Class-Books

Astronomy, by R. S. Ball, LL.D. F.R.S. 1s. 6d.
Botany, Morphology and Physiology, by W. R. McNab, M.D. 1s. 6d.
— the Classification of Plants, by W. R. McNab, M.D. 1s. 6d.
Geometry, Congruent Figures, by O. Henrici, F.R.S. 1s. 6d.
Hydrostatics and Pneumatics, by P. Magnus, B.Sc. 1s. 6d. or with Answers 2s.
Laws of Health, by W. H. Corfield, M.A. M.D. 1s. 6d.
Mechanics, by R. S. Ball, LL.D. F.R.S. 1s. 6d.
Practical Physics: Molecular Physics & Sound, by F. Guthrie, F.R.S. 1s. 6d.
Thermodynamics, by R. Wormell, M.A. D.Sc. 1s. 6d.
Zoology of Vertebrate Animals, by A. McAlister, M.D. 1s. 6d.
Zoology of Invertebrate Animals, by A. McAlister, M.D. 1s. 6d.

Mechanics & Mechanism

Barry's Railway Appliances, fcp. 8vo. Woodcuts 3s. 6d.
Goodeve's Elements of Mechanism, crown 8vo. 6s.
— Principles of Mechanics, crow 8vo. 6s.
Haughton's Animal Mechanics, 8vo. 21s.
Magnus's Lessons in Elementary Mechanics, fcp. 8vo. 3s. 6d.
Shelley's Workshop Appliances, small 8vo. Woodcuts 4s. 6d.
Tate's Elements of Mechanism, 12mo. 3s. 6d.
— Exercises on Mechanics and Natural Philosophy, 12mo. 2s. Key 2s. 6d.
— Mechanics and the Steam-Engine, for Beginners, 18mo. 9d.
Twisden's Introduction to Practical Mechanics, crown 8vo. 10s. 6d.
— First Lessons in Theoretical Mechanics, crown 8vo. 8s. 6d.

Engineering, Architecture, &c.

Anderson (Sir J.) on the Strength of Materials and Structures, small 8vo. 3s. 6d.
Bourne's Treatise on the Steam-Engine, 4to. 42s.
— Catechism of the Steam-Engine, fcp. 8vo. 6s.
— Recent Improvements in the Steam-Engine, fcp. 8vo. 6s.
— Handbook of the Steam-Engine, fcp. 8vo. 9s.
Downing's Elements of Practical Construction, PART I. 8vo. Plates 14s.
Fairbairn's Useful Information for Engineers. 3 vols. crown 8vo. 31s. 6d.
Gwilt's Encyclopædia of Architecture, 8vo. 52s. 6d.
Hulme's Art-Instruction in England, fcp. 8vo. 3s. 6d.
Mitchell's Stepping-Stone to Architecture, 18mo. Woodcuts 1s.
Perry's Greek and Roman Sculpture, square crown 8vo. Woodcuts 31s. 6d.
Sennett's Marine Steam Engine, 8vo. 21s.

Popular Astronomy & Navigation.

Ball's Elements of Astronomy, fcp. 8vo. 6s.
Brinkley's Astronomy, by Stubbs & Brünnow, crown 8vo. 6s.
Evers's Navigation & Great Circle Sailing, 18mo. 1s.
Herschel's Outlines of Astronomy, Twelfth Edition, square crown 8vo. 12s.
Jeans's Handbook for the Stars, royal 8vo. 4s. 6d.
— Navigation and Nautical Astronomy, royal 8vo. *Practical*, 7s. 6d. Part II. *Theoretical*, 7s. 6d. or the 2 Parts in 1 vol. price 14s.
Kimber's Elementary Astronomy, 8vo. 2s. 6d.
Laughton's Nautical Surveying, fcp. 8vo. 6s.
Merrifield's Treatise on Navigation, crown 8vo 9s.

London, LONGMANS & CO.

Proctor's Lessons in Elementary Astronomy, fcp. 8vo. 1s. 6d.
— Library Star Atlas, folio 15s.
— New Star Atlas for Schools, crown 8vo. 5s.
— Treatise on the Cycloid, crown 8vo. 10s. 6d.
The Stepping-Stone to Astronomy, 18mo. 1s.
Tate's Astronomy and the use of the Globes, for Beginners, 18mo. 9d.
Webb's Celestial Objects for Common Telescopes, crown 8vo. 9s.

Animal Physiology & Preservation of Health.

Bray's Education of the Feelings, crown 8vo 2s. 6d.
— Physiology and the Laws of Health, 11th Thousand, fcp. 8vo. 1s. 6d.
— Diagrams for Class Teaching per pair 6s. 6d.
— Science of Man, crown 8vo. 6s.
Buckton's Food and Home Cookery, crown 8vo. 2s. 6d.
— Health in the House, crown 8vo. 2s.
Corfield's Laws of Health, fcp. 8vo. 1s. 6d.
House I Live In; Structure and Functions of the Human Body, 18mo. 2s. 6d.
Mapother's Animal Physiology, 18mo. 1s.

General Knowledge and *Chronology.*

Crook's Events of England in Rhyme, square 16mo. 1s.
Slater's *Sententiæ Chronologicæ*, the Original Work, 12mo. 1s. 6d.
— — — improved by Miss Sewell, 12mo. 3s. 6d.
Stepping-Stone (The) to Knowledge, 18mo. 1s.
Second Series of the Stepping-Stone to General Knowledge, 18mo. 1s.
Sterne's Questions on Generalities, Two Series, each 2s. Keys each 4s.

Mythology & Antiquities.

Becker's *Gallus*, Roman Scenes of the Time of Augustus, post 8vo. 7s. 6d.
— *Charicles*, illustrating the Private Life of the Ancient Greeks ... 7s. 6d.
Ewald's Antiquities of Israel, translated by Solly, 8vo. 12s. 6d.
Gort's New Pantheon, 18mo. with 17 Plates 2s. 6d.
Rich's Illustrated Dictionary of Roman and Greek Antiquities, post 8vo.... 7s. 6d.
Witt's Myths of Hellas, translated by Younghusband, crown 8vo. 3s. 6d.

Biography.

Gleig's Life of the Duke of Wellington, crown 8vo. 6s.
Macaulay's Clive, annotated by H. C. Bowen, M.A. fcp. 8vo. 2s. 6d.
— Warren Hastings, annotated by S. Hales, fcp. 8vo. 1s. 6d.
Maunder's Biographical Treasury, re-written by W. L. R. Cates, fcp. 8vo. 6s.
Stepping-Stone (The) to Biography, 18mo. 1s.

English History Reading Books.

II. Old Stories from British History, by F. York Powell, M.A., with 19 Woodcuts 6d.
III. Alfred the Great and William the Conqueror, by F. York Powell, M.A., with 9 Woodcuts 8d.

First Series.
Without Annotations or other Aids:

IV. Outlines of English History from B.C. 55 to A.D. 1603, by S. R. Gardiner, with 47 Woodcuts & Maps. 1s.
V. Outlines of English History, Second Period, from 1603—1880, by S. R. Gardiner, with 40 Woodcuts and Maps, 1s. 6d.
VI. Historical Biographies, by S. R. Gardiner. *[In preparation.*

Alternative Series, in larger type and on thicker paper, with Vocabularies, Annotations, & Analyses:

IV. Illustrated English History, Part I, from B.C. 55 to A.D. 1485, by S. R. Gardiner, 1s.
V. Illustrated English History, Part II. from 1485 to 1689, by S. R. Gardiner, 1s. 3d.
VI. Illustrated English History, Part III. from 1689 to 1880, by S. R. Gardiner, 1s. 6d.

VII. The English Citizen and the English State, by F. York Powell, M.A. *[In preparation.*

Epochs of Modern History.

Church's Beginning of the Middle Ages, fcp. 8vo. Maps 2s. 6d.
Cox's Crusades, fcp. 8vo. Maps 2s. 6d.
Creighton's Age of Elizabeth, fcp. 8vo. Maps 2s. 6d.
Gairdner's Houses of Lancaster & York, fcp. 8vo. Maps 2s. 6d.
Gardiner's Thirty Years' War, 1618-1648, fcp. 8vo. Maps 2s. 6d.
— First Two Stuarts and the Puritan Revolution, fcp. 8vo. Maps 2s. 6d.
— (Mrs.) French Revolution, 1789-1795, Maps 2s. 6d.
Hale's Fall of the Stuarts, fcp. 8vo. Maps 2s. 6d.
Johnson's Normans in Europe, fcp. 8vo. Maps 2s.
Longman's Frederick the Great and the Seven Years' War, fcp. 8vo. Maps 2s. 6d.
Ludlow's War of American Independence, fcp. 8vo. Maps 2s. 6d.
McCarthy's Epoch of Reform, 1830-1850 2s. 6d.
Moberly's Early Tudors *In preparation.*
Morris's Age of Anne, fcp. 8vo. Maps 2s. 6d.
— Early Hanoverians *In preparation*
Seebohm's Protestant Revolution, fcp. 8vo. Maps 2s. 6d.
Stubbs's Early Plantagenets, fcp. 8vo. Maps 2s. 6d.
— Empire under the House of Hohenstaufen *In preparation.*
Warburton's Edward the Third, fcp. 8vo. Maps 2s. 6d.

Epochs of English History.

Creighton's Shilling History of England, Introductory, fcp. 8vo 1s.
Browning's Modern England, from 1820 to 1876. 9d.
Cordery's Struggle against Absolute Monarchy, 1603-1688, fcp. Maps 9d.
Creighton's England a Continental Power, 1066-1216, fcp. Maps. 9d.
— Tudors and the Reformation, 1485-1603, fcp. 8vo. Maps. 9d.
Powell's Early England up to the Norman Conquest, fcp. 8vo. Maps. 1s.
Rowley's Rise of the People and Growth of Parliament, 1215-1485, fcp. Maps. 9d.
— Settlement of the Constitution, 1688-1778, fcp. Maps 9d.
Tancock's England during the Revolutionary Wars, 1778-1820. 9d.
Epochs of English History, complete in 1 vol. fcp. 8vo. 5s.

British History.

Cantlay's English History Analysed, fcp. 8vo. 2s.
Catechism of English History, edited by Miss Sewell, 18mo. 1s. 6d.
Epochs of English History, edited by Creighton, fcp. 8vo. 5s.
Gardiner's Outline of English History, fcp. 8vo Woodcuts and Maps 2s. 6d.
Gleig's First Book of History—England, 18mo. 2s. or 2 Parts, 9d. each.
- British Colonies, or Second Book of History. 18mo 1s.
- British India, or Third Book of History, 18mo 9d.
- Historical Questions on the above Three Histories, 18mo. 9d.

Littlewood's Essentials of English History, fcp. 8vo. 3s.
Lupton's Concise English History for Candidates, cr. 8vo. 3s. 6d.
— Examination-Papers in History, crown 8vo. 1s.
— School English History, revised, crown 8vo. 7s. 6d.
Macaulay's History of England, Student's Edition, 2 vols. crown 8vo. 12s.
Morris's Class-Book History of England, fcp. 8vo. 3s. 6d.
— Senior Standard History Readers, I. and II.. 1s. 6d. each; III., 1s. 9d.
Rannie's Outline of the English Constitution, fcp. 8vo. 2s. 6d.
The Stepping-Stone to English History, 18mo. 1s.
The Stepping-Stone to Irish History, 18mo. 1s.

Epochs of Ancient History.

Beesly's Gracchi, Marius and Sulla, fcp. 8vo. Maps 2s. 6d.
Capes's Age of the Antonines, fcp. 8vo. Maps 2s. 6d.

Capes's Early Roman Empire, fcp. 8vo. Maps 2s. 6d.
Cox's Athenian Empire, fcp. 8vo. Maps 2s. 6d.
— Greeks & Persians, fcp. 8vo. Maps 2s. 6d.
Curteis's Rise of the Macedonian Empire, fcp. 8vo. Maps 2s. 6d.
Ihne's Rome to its Capture by the Gauls, fcp. 8vo. Maps 2s. 6d.
Merivale's Roman Triumvirates, fcp. 8vo. Maps 2s. 6d.
Sankey's Spartan and Theban Supremacies, fcp. 8vo. Maps 2s. 6d.
Smith's Rome and Carthage, the Punic Wars, fcp. 8vo. Maps 2s. 6d.

History, Ancient & Modern.

Browne's History of Greece, for Beginners, 18mo. 9d.
— History of Rome, for Beginners, 18mo. 9d.
Cox's General History of Greece, crown 8vo. 7s. 6d.
Gleig's History of France, 18mo. 1s.
Mangnall's Historical and Miscellaneous Questions, 18mo 4s. 6d.
Maunder's Historical Treasury, with Index, fcp. 8vo 6s.
Merivale's History of the Romans under the Empire, 8 vols. post 8vo 48s.
— Fall of the Roman Republic, 12mo. 7s. 6d.
— General History of Rome, crown 8vo. Maps 7s. 6d.
Puller's School History of Rome, abridged from Merivale, fcp. Maps 3s. 6d.
Rawlinson's Ancient Egypt, 2 vols. 8vo. Illustrations 63s.
— Seventh Oriental Monarchy (the Sassanians) 8vo. Maps &c. ... 28s.
Sewell's Ancient History of Egypt, Assyria, and Babylonia, fcp. 8vo. 6s.
— Catechism of Grecian History, 18mo. 1s. 6d.
— Child's First History of Rome, fcp. 8vo 2s. 6d.
— First History of Greece, fcp. 8vo. 3s. 6d.
— Popular History of France, crown 8vo. 7s. 6d.
Smith's Carthage and the Carthaginians, crown 8vo 10s. 6d.
The Stepping-Stone to Grecian History, 18mo. 1s.
The Stepping-Stone to Roman History, 18mo. 1s.
Taylor's Student's Manual of Ancient History, crown 8vo 7s. 6d.
— Student's Manual of Modern History, crown 8vo 7s. 6d.
— Student's Manual of the History of India, crown 8vo 7s. 6d.

Scripture History, Moral & Religious Works.

Ayre's Treasury of Bible Knowledge, fcp. 8vo. 6s.
Boultbee's Commentary on the Thirty-Nine Articles, crown 8vo. 6s.
Bray's (Mrs.) Elements of Morality, fcp. 8vo 2s. 6d.
Browne's Exposition of the Thirty-Nine Articles, 8vo. 16s.
Examination Questions on the above, by Gorle, fcp. 8vo 3s. 6d.
Conder's Handbook to the Bible, post 8vo. Maps, &c. 7s. 6d.
Conybeare and Howson's Life and Epistles of St. Paul, 1 vol. crown 8vo. ... 7s. 6d.
Davidson's Introduction to Study of the New Testament, 2 vols. 8vo. 30s.
Gleig's Sacred History, or Fourth Book of History, 18mo. 2s. or 2 Parts, each 9d.
Norris's Catechist's Manual, 18mo. 1s. 3d.
Potts's Paley's Evidences and Horæ Paulinæ, 8vo. 10s. 6d.
Riddle's Manual of Scripture History, fcp. 8vo 4s. Outlines of ditto, ... 2s. 6d.
Rogers's School and Children's Bible, crown 8vo. 2s.
Rothschild's History and Literature of the Israelites, 2 vols. crown 8vo. 12s. 6d. or in 1 vol. fcp. 8vo. 3s. 6d.
Sewell's Preparation for the Holy Communion, 32mo. 3s.
The Stepping-Stone to Bible Knowledge, 18mo. 1s.
Whately's Introductory Lessons on Christian Evidences, 18mo 6d.
Auden's Analysis. 6d. Joly's Questions, 2d.

Mental & Moral Philosophy, & Civil Law.

Abbott's Elements of Logic, 1s. 2d., 2s. 6d., and 3s. cloth.
Amos's Science of Jurisprudence, 8vo. 18s.
— Primer of English Constitution and Government, crown 8vo. 6s.
Bacon's Essays, with Annotations by Archbishop Whately, 8vo. 10s. 6d.
— — annotated by Hunter, crown 8vo. 2s. 6d.
— — annotated by Abbott, 2 vols. fcp. 8vo. 6s.
Bain's Rhetoric and English Composition, crown 8vo. 4s.
— Mental and Moral Science, crown 8vo. 10s. 6d.
Hume's Treatise on Human Nature, by Green and Grose, 2 vols. 8vo. 28s.
— Essays, by the same Editors, 2 vols. 8vo. 28s.
Kant's Critique of Practical Reason, translated by T. K. Abbott, 8vo. ... 12s. 6d.
Mullick's Student's Handbook of Mill's System of Logic, crown 8vo. 3s. 6d.
Lewes's History of Philosophy from Thales to Comte, 2 vols. 8vo. 32s.
Lewis's Influence of Authority in Matters of Opinion, 8vo. 14s.
Mill's System of Logic, Ratiocinative and Inductive, 2 vols. 8vo. 25s.
Morell's Handbook of Logic, for Schools and Teachers, fcp. 8vo. 2s.
Rannie's Historical Outline of the English Constitution, fcp. 8vo 2s. 6d.
Sandars's Institutes of Justinian, 8vo. 18s.
Stebbing's Analysis of Mill's Logic, 12mo. 3s. 6d.
Swinburne's Picture Logic, crown 8vo. 5s.
Thomson's Outline of the Necessary Laws of Thought, post 8vo. 6s.
Whately's Elements of Logic, 8vo. 10s. 6d. crown 8vo. 4s. 6d.
— Elements of Rhetoric, 8vo. 10s. 6d. crown 8vo. 4s. 6d.
— Lessons on Reasoning, fcp. 8vo. 1s. 6d.

Principles of Teaching, &c.

Crawley's Handbook of Competitive Examinations for 1883, crown 8vo. ... 2s. 6d.
Gill's Text-Book of Education, Method and School Management, fcp. 8vo. 3s.
— Systems of Education, fcp. 8vo. 2s. 6d.
— Art of Religious Instruction, fcp. 8vo. 2s.
— Art of Teaching to Observe and Think, fcp. 8vo. 2s.
— Locke's Principles of Education, fcp. 8vo. 1s.
Hewitt's Simple Object Lessons for Infants, fcp. 8vo. First Series 8d.
Johnston's (R.) Civil Service Guide, crown 8vo. 2s. 6d.
— Guide to Candidates for the Excise, 18mo. 1s. 6d.
— Guide to Candidates for the Customs, 18mo. 1s.
Lake's Book of Oral Object Lessons on Common Things, 18mo. 1s. 6d.
Miller's (Mrs.) Readings in Social Economy, crown 8vo. 5s.
Potts's Account of Cambridge Scholarships and Exhibitions, crown 8vo. ... 5s.
Robinson's Manual of Method and Organisation, fcp. 8vo. 3s. 6d.
Sewell's Principles of Education, 2 vols. fcp. 8vo. 12s. 6d.
Sullivan's Papers on Education and School-Keeping, 12mo. 2s.

The Greek Language.

Bloomfield's College and School Greek Testament, fcp. 8vo. 5s.
Bolland & Lang's Politics of Aristotle, post 8vo. 7s. 6d.
Bullinger's Lexicon and Concordance to Greek Testament, medium 8vo. ... 30s.
Collis's Chief Tenses of the Greek Irregular Verbs, 8vo. 1s.
— Pontes Græci, Stepping Stone to Greek Grammar, 12mo. 3s. 6d.
— Praxis Græca, Etymology, 12mo. 2s. 6d.
— Greek Verse-Book, Praxis Iambica, 12mo. 4s. 6d.
Farrar's Brief Greek Syntax and Accidence, 12mo. 4s. 6d.
— Greek Grammar Rules for Harrow School, 12mo. 1s. 6d.
Grant's Ethics of Aristotle, with Essays and Notes, 2 vols. 8vo. 32s.

Hewitt's Greek Examination-Papers, 12mo. 1s. 6d.
Isbister's Xenophon's Anabasis, Books I. to III. with Notes, 12mo. 2s. 6d.
Jerram's Graece Reddenda, crown 8vo. 1s. 6d.
Kennedy's Greek Grammar, 12mo. 4s. 6d.
Liddell & Scott's English-Greek Lexicon, 4to. 36s. Square 12mo. 7s. 6d.
Linwood's Sophocles, Greek Text, Latin Notes, 4th Edition, 8vo. 16s.
— Theban Triology of Sophocles literally explained, crown 8vo. ... 7s. 6d.
Mahaffy's Classical Greek Literature, cr. 8vo. Poets, 7s. 6d. Prose Writers 7s. 6d.
Morris's Greek Lessons, square 18mo. Part I. 2s. 6d. Part II. 1s.
Parry's Elementary Greek Grammar, 12mo. 3s. 6d.
Plato's Republic, Book I. Greek Text, English Notes by Hardy, crown 8ov. 3s.
Sheppard and Evans's Notes on Thucydides, crown 8vo. 7s. 6d.
Thucydides' Peloponnesian War, translated by Crawley. 8vo. 10s. 6d.
Valpy's Greek Delectus, improved by White, 12mo. 2s. 6d. Key 2s. 6d.
White's Xenophon's Expedition of Cyrus, with English Notes, 12mo. 7s. 6d.
Wilkins's Manual of Greek Prose Composition, crown 8vo. 5s. Key 5s.
— Exercises in Greek Prose Composition, crown 8vo. ... 4s. 6d. Key 2s. 6d.
— New Greek Delectus, crown 8vo. 3s. 6d. Key 2s. 6d.
— Progressive Greek Delectus, 12mo. 4s. Key 2s. 6d.
— Progressive Greek Anthology, 12mo. 5s.
— Scriptores Attici, Excerpta with English Notes, crown 8vo. ... 7s. 6d.
— Speeches from Thucydides translated, post 8vo. 6s.
Williams's Nicomachean Ethics of Aristotle translated, crown 8vo. 7s. 6d.
Yonge's English-Greek Lexicon 4to. 21s. Square 12mo. 8s. 6d.
Zeller's Eclecticism in Greek Philosophy, translated by Alleyne, crown 8vo. 10s. 6d.
— Plato and the Older Academy, by Alleyne & Goodwin, cr. 8vo. 18s.
— Pre-Socratic Schools, translated by Alleyne, 2 vols., crown 8vo. ... 30s.
— Socrates, translated by Reichel, crown 8vo. 10s. 6d.
— Stoics, Epicureans, and Sceptics, by Reichel, crown 8vo. 15s.

White's Grammar-School Greek Texts.

Æsop (Fables) and Palæphatus (Myths), 32mo. Price 1s.
Homer, Iliad, Book I. 1s.
— Odyssey, Book I. 1s.
Lucian, Select Dialogues 1s.
Xenophon, Anabasis, Books I. III. IV. V. & VI. 1s. 6d. each; Book II. 1s.; Book VII. 2s.
Book I. without Vocabulary, 3d.
St. Matthew's and St. Luke's Gospels, 2s. 6d. each.
St. Mark's and St. John's Gospels, 1s. 6d. each.
The Acts of the Apostles 2s. 6d.
St. Paul's Epistle to the Romans 1s. 6d.

The Four Gospels in Greek, with Greek-English Lexicon. Edited by John T. White, D.D. Oxon. Square 32mo. price 5s.

White's Grammar-School Latin Texts.

Cæsar, Gallic War, Books I. & II. V. & VI. 1s. each. Book I. without Vocabulary, 3d.
Cæsar, Gallic War, Books III. & IV. 2d. each.
Cæsar Gallic War, Book VII.... 1s. 6d.
Cicero, Cato Major 1s. 6d.
Cicero, Lælius 1s. 6d.
Eutropius, Roman History. Books I. & II. 1s. Books III. & IV. 1s.
Horace, Odes, Book I. II. & IV. 1s. each.
Horace, Odes, Book III... 1s. 6d.
Horace, Book of Epodes Price 9d.
Nepos, Miltiades, Cimon, Pausanias, Aristides 1s.
Ovid, Selections from Epistles and Fasti 2d.
Ovid, Select Myths from Metamorphoses 2d.
Phædrus, Select Easy Fables ... 9d.
Phædrus, Fables, Book I. & II. 1s.
Sallust, Bellum Catilinarium ... 1s. 6d.
Virgil, Georgics, Book IV. 1s.
Virgil, Æneid, Books I. to VI. 1s. each. Book I. without Vocabulary... 3d.
Virgil, Æneid, Bks. VIII. X. XI. 1s. 6d. ea.
Livy, Books XXII. and XXIII. The Latin Text with English Explanatory and Grammatical Notes, and a Vocabulary of Proper Names. Edited by *John T. White, D.D.* Oxon. 12mo. price 2s. 6d. each Book.

The Latin Language.

Bradley's Latin Prose Exercises, 12mo. ... 3s. 6d. **Key** 5s.
— Continuous Lessons in Latin Prose, 12mo. ... 5s. **Key** 5s. 6d.
— Cornelius Nepos, improved by White, 12mo. ... 3s. 6d.
— Ovid's Metamorphoses, improved by White, 12mo. ... 4s. 6d.
— Select Fables of Phædrus, improved by White, 12mo. ... 2s. 6d.
— Eutropius, improved by White, 12mo. ... 2s. 6d
Collis's Chief Tenses of Latin Irregular Verbs, 8vo. ... 1s.
— Pontes Latini, Stepping Stone to Latin Grammar, 12mo. ... 3s. 6d.
Hewitt's Latin Examination-Papers, 12mo. ... 1s. 6d.
Isbister's Cæsar, Books I.—VII. 12mo. 4s. or with Reading Lessons ... 4s. 6d.
— Cæsar's Commentaries, Books I.—V. 12mo. ... 3s. 6d.
— First Book of Cæsar's Gallic War, 12mo. ... 1s. 6d.
Jeffcott & Tossell's Helps for Latin Students, fcp. 8vo. ... 2s.
Jerram's Latinè Reddenda, crown 8vo. ... 1s.
Kennedy's Child's Latin Primer, or First Latin Lessons, 12mo. ... 2s.
— Child's Latin Accidence, 12mo. ... 1s.
— Elementary Latin Grammar, 12mo. ... 3s. 6d.
— Elementary Latin Reading-Book, or Tirocinium Latinum, 12mo. 2s.
— Latin Prose, Palæstra Stili Latini, 12mo. ... 6s.
— Subsidia Primaria, Exercise Books to the Public School Latin Primer. I. Accidence and Simple Construction, 2s. 6d. II. Syntax ... 3s. 6d.
Key to the Exercises in Subsidia Primaria, Parts I. & II. price 5s.
Kennedy's Subsidia Primaria, III. the Latin Compound Sentence, 12mo. 1s.
— Curriculum Stili Latini, 12mo. 4s. 6d. Key, 7s. 6d.
— Palæstra Latina, or Second Latin Reading-Book, 12mo. ... 5s.
Kenny's Virgil's Æneid, Books I. II. III. & V. 18mo. ... each Book 1s.
Millington's Latin Prose Composition, crown 8vo. ... 3s. 6d.
— Selections from Latin Prose, crown 8vo. ... 2s. 6d.
Moody's Eton Latin Grammar, 12mo. 2s.6d. The Accidence separately ... 1s.
Morris's Elementa Latina, fcp. 8vo. ... 1s. 6d. **Key** 2s. 6d.
Parry's Origines Romanæ, from Livy, with English Notes, crown 8vo. ... 4s.
The Public School Latin Primer, 12mo. ... 2s. 6d.
— — — Grammar, by Rev. Dr. Kennedy, post 8vo. ... 7s. 6d.
Prendergast's Mastery Series, Manual of Latin, 12mo. ... 2s. 6d.
Rapier's Introduction to Composition of Latin Verse, 12mo. ... 3s. 6d. **Key** 2s. 6d.
Riddle's Young Scholar's Lat.-Eng. & Eng.-Lat. Dictionary, square 12mo. ... 10s. 6d.
Separately { The Latin-English Dictionary, 6s.
The English-Latin Dictionary, 5s.
Riddle and Arnold's English-Latin Lexicon, 8vo. ... 21s.
Sheppard and Turner's Aids to Classical Study, 12mo. ... 3s. **Key** 6s.
Simcox's Latin Classical Literature, 2 vols. 8vo. ... 32s.
Valpy's Latin Delectus, improved by White, 12mo. ... 2s. 6d
Virgil's Æneid, translated into English Verse by Conington cr. 8vo. ... 9s.
— Works, edited by Kennedy, crown 8vo. ... 10s. 6d.
— — translated into English Prose by Conington, cr. 8vo. ... 9s.
Walford's Progressive Exercises in Latin Elegiac Verse, 12mo. 3s. 6d. **Key** 5s.
White and Riddle's Large Latin-English Dictionary, 1 vol. 4to. ... 21s.
White's Concise Latin-English Dictionary for Univy. Students, royal 8vo. 12s.
White's Junior Student's Eng.-Lat. & Lat.-Eng. Dictionary, sq. 12mo. ... 12s.
Separately { The Latin-English Dictionary, price 7s. 6d.
The English-Latin Dictionary, price 5s. 6d.
— Middle-Class Latin Dictionary, square fcp. 8vo. ... 3s.
Wilkins's Progressive Latin Delectus, 12mo. ... 2s.
— Easy Latin Prose Exercises, crown 8vo. 2s. 6d. ... **Key** 2s. 6d.
— Manual of Latin Prose Composition, crown 8vo. ... 4s. 6d. **Key** 2s. 6d.
— Latin Prose Exercises, crown 8vo. ... 4s. 6d. **Key** 5s.
— Rules of Latin Syntax, 8vo. ... 2s.
— Notes for Latin Lyrics (in use in Harrow, &c.) 12mo. ... 4s. 6d.
— Latin Anthology, for the Junior Classes, 12mo. ... 3s. 6d.
Yonge's Library Edition of the Works of Horace, 8vo. ... 21s.
— Latin Gradus, post 8vo. 9s. or with Appendix ... 12s.

The French Language.

Albitès' How to Speak French, fcp. 8vo. 5s. 6d.
— **Instantaneous French Exercises**, fcp. 2s. Key, 2s.
Cassal's French Genders, crown 8vo. 3s. 6d.
Cassal & Karcher's Graduated French Translation Book, Part I. 3s. 6d. Part II. 5s.
Key to Part I. by Professor Cassal, price 5s.
Contanseau's Practical French and English Dictionary, post 8vo. 8s. 6d.
— **Pocket French and English Dictionary**, square 18mo. 1s. 6d.
— **Premières Lectures**, 12mo. 2s. 6d.
— **First Step to French**, 12mo. 2s. 6d. Key 2s.
— **French Accidence**, 12mo. 2s. 6d.
— — **Grammar**, 12mo. 4s. Key 2s.

Contanseau's Middle-Class French Course, fcp. 8vo.

Accidence, 8d.
Syntax, 8d.
French Conversation-Book, 8d.
First French Exercise-Book, 8d.
Second French Exercise-Book, 8d.
French Translation-Book, 8d.
Easy French Delectus, 8d.
First French Reader, 8d.
Second French Reader, 8d.
French and English Dialogues, 8d.

Contanseau's Guide to French Translation, 12mo. 3s. 6d. Key 3s. 6d.
— **Prosateurs et Poètes Français**, 12mo. 5s.
— **Précis de la Littérature Française**, 12mo. 3s. 6d.
— **Abrégé de l'Histoire de France**, 12mo. 3s. 6d.
Jerram's Sentences for Translation into French, crown 8vo. 1s. Key, 2s. 6d.
Merlet's French Grammar, fcp. 8vo. 5s. 6d.
— **French Pronunciation and Accidence**, fcp. 3s. 6d. } Key, price 2s. 6d.
— **Syntax of the French Grammar**, fcp. 3s. 6d.
— **Le Traducteur**, fcp. 8vo. 5s. 6d
— **Stories for French Writers**, fcp. 8vo. 2s.
— **Aperçu de la Littérature Française**, fcp. 8vo. 3s. 6d.
— **Exercises in French Composition**, fcp. 8vo. 3s. 6d.
— **French Synonymes**, fcp. 8vo. 3s. 6d.
— **Synopsis of French Grammar**, fcp. 8vo. 2s. 6d.
Prendergast's Mastery Series, French. 12mo. 2s. 6d.
The Stepping-Stone to French Pronunciation, 18mo. 1s.
Souvestre's Philosophe sous les Toits, by Stièvenard, square 18mo. 1s. 6d
Stièvenard's Lectures Françaises from Modern Authors, 12mo. 4s. 6d
— **Rules and Exercises on the French Language**, 12mo. 3s. 6d.
Tarver's Eton French Grammar, 12mo. 6s. 6d.

German, Spanish, Hebrew, Sanskrit.

Blackley's Practical German & English Dictionary, post 8vo. 7s. 6d.
Buchheim's German Poetry, for Repetition, 18mo. 3s. 6d.
Collis's Card of German Irregular Verbs, 8vo. 2s.
Fischer-Fischart's Elementary German Grammar, fcp. 8vo. 3s. 6d
Just's German Grammar, 12mo. 1s. 6d.
— **German Reading Book**, 12mo. 3s. 6d.
Kalisch's Hebrew Grammar, 8vo. Part I. 12s. 6d. Key 5s. Part II. 12s. 6d.
Longman's Pocket German & English Dictionary, square 18mo. 5s.
Milne's Practical Mnemonic German Grammar, crown 8vo. 3s. 6d.
Müller's (Max) Sanskrit Grammar for Beginners, royal 8vo. 15s.
Naftel's Elementary German Course for Public Schools, fcp. 8vo.

German Accidence, 9d.
German Syntax, 9d.
First German Exercise-Book, 9d.
Second German Exercise-Book, 9d.
German Prose Composition Book, 9d
First German Reader, 9d.
Second German Reader, 9d.

Prendergast's Handbook to the Mastery Series, 12mo. 2s. 6d.
— **Mastery Series, German**, 12mo. 2s. 6d.
— **Manual of Spanish**, 12mo. 2s. 6d.
— **Manual of Hebrew**, crown 8vo. 3s. 6d.
Quick's Essentials of German, crown 8vo. 2s. 6d.
Seiss's School Edition of Goethe's Faust, crown 8vo. 5s.
— **Outline of German Literature**, crown 8vo. 4s. 6d.
Wirth's German Chit-Chat, crown 8vo. 2s. 6d

London. LONGMANS & CO.

Spottiswoode & Co. Printers, New-street Square, London.

